Amateur Radio

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OF AUSTRALIA
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Radio Amateurs: Have you checked out EA lately?

No doubt most radio amateurs are aware that *Electronics Australia* is by far this country's largest-selling electronics magazine, as well as being its oldest (we began way back in 1922, as *Wireless Weekly*). But have you looked inside the magazine lately?

Remember Jim Rowe, VK2ZLO? Jim used to be Technical Editor, and then Editor – back in the late 1960's and 1970's. You may recall some of the amateur radio and test equipment projects he developed, which proved to be extremely popular. Well, Jim is back at the helm of the magazine, and has been busy giving it a new lease of life.

You'll now find lots of new 'departments' in the magazine, including Solid State Update (with news of new semiconductor devices), Silicon Valley Update (news from the USA) and What's New in Entertainment Electronics. Plus all of your old favourites like Forum, The Serviceman, Circuit and Design Ideas and so on. And of course plenty of 'meaty' technical articles and contruction projects.

FEATURES IN THE OCTOBER ISSUE:

RADIO CONTROLLED MODEL HELICOPTER

The Uni of Tasmania is using a seven-channel radio control system on 36MHz to control a model helicopter for aerial surveying. It isn't easy to fly, though, as Tom Moffat discovered!

CSIRO BREAKTHROUGH IN MILLIMETRE-WAVE TRANSISTORS

Australia's own CSIRO has produced gallium-arsenide HEMT transistors with cutoff frequencies well beyond 100GHz. Find out how they work, and how they're made.

TV-DERIVED TIME & FREQUENCY STANDARD

The second article on this new unit, which can give you reference signals with an accuracy very close to a Rubidium standard. Designed by Ian Pogson, VK2AZN.

What about *amateur radio* projects? Well, there still aren't too many, at present – Jim Rowe's been a bit too busy! But he's *very* interested in boosting the amateur radio content, so if YOU have developed an exciting amateur radio project, please contact Jim by writing to him at EA, 180 Bourke Road, Alexandria 2015 or phoning him on (02) 693 6620 – to discuss the possibility of publishing it as a contributed article.

Take a look at the new, rejuvenated *Electronics Australia* – on sale at your newsagent at the beginning of every month. Or subscribe now, by phoning (02) 693 9517 or 693 9515.

Electronics Australia

Australia's Top Selling Electronics Magazine

Amateur Radio

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Cover

Our first look at the new Kenwood HF transceiver, TS950SD, which is the new flagship of the extensive Kenwood fleet of amateur radio transceivers.

No Free Lunches

This month I would like to follow up last month's comments on cost of member services in the various Divisions by talking more about the situation here in the Executive Office. Some people, in response to rising fees, have suggested that the WIA (and particularly the Executive Office) is becoming too professional and, therefore, too expensive. Only someone close to the Federal scene can put this into its right perspective. The essential question is, "Do we have cheap volunteers or paid specialists?" As mentioned last month, the two largest Divisions (VK2 and VK3), each with more than 2,000 members, have found it necessary to employ secretarial and managerial staff. This is even more so in the Federal case, with responsibility for all seven Divisions, all national and international negotiations affecting amateur radio in Australia, and the production of this magazine.

Here I can speak as a volunteer of many years involvement with the WIA. Even though I retired two years ago from a regular daily job, the sheer volume of work needed to edit the magazine required more time than I was willing to lose from other activities (particularly home-brew construction, on-air operating, and a bit of sailing!) Fortunately, the use by our new typesetters (as from February) of more time-efficient computerised layout techniques saved enough money (compared with older "paste-up" procedures) to pay for Graham Thornton to become Managing Editor. Improved efficiency pays for a professional, who in turn further improves efficiency. Now I can catch up on a backlog of letters, some of which have needed my reply for over a year!

But all of these correspondents have already received a brief acknowledging reply, so at least they know their letter has been delivered to us! Until Bill Roper became General Manager and Secretary, this wasn't so! One of Bill's first innovations was to introduce new computers and streamlined computerised procedures to the Office, so that all correspondence is now handled far more efficiently, and file management greatly improved. The WIA financial situation is all on computer, updated as often as necessary; and Executive now knows, without guess work, which way to proceed. Of course, all this costs money, not only in hardware and software, but Bill's salary as well. Again, the professional increases efficiency, in this case not only helping to pay his salary, but enabling us to provide services that otherwise would be impossible. Incidentally, I think it is only fair to mention that Bill's management expertise could command twice the salary elsewhere! Only his devotion to amateur radio impels him to work inordinately long hours for relatively little money!

Salt Lakes

Changing the theme, it may be that by the time you read this we may be maritime-mobile on one of the flooded South Australian salt lakes. We are still not 100 percent sure of when and where, but hopefully towards the end of September at least on Lakes Torrens and Eyre South. More soon on the Divisional news broadcasts. Talk to you from the boat, on one band or another. 73 till then.

Bill Rice VK3ABP
Executive Editor

PS: I was wrong in the September Comment as regards ownership of repeaters in VK2. Only VK2RWI at Dural is owned by VK2 Division.

WIA NEWS

Bill Roper VK3ARZ, General Manager & Secretary

HF Contest Championship

Contests are an important and exciting part of the activity of amateur radio, and have been so since the earliest days of organised amateur radio communication.

The WIA sponsors four major HF contests each year:

John Moyle Memorial Field Day Contest
Remembrance Day Contest
VK Novice Contest
VK/ZL/Oceania Contest.

In 1984 an HF Contest Championship competition was introduced on an annual basis. To be eligible for this competition entrants must participate in at least three of the four HF contests sponsored by the WIA. Points are allocated for the top 10 scorers in each State in each of the contests, with 10 points being for the highest score, down to one point for the tenth position. Points are allocated on a State basis to overcome any unfairness due to geographic or propagation advantages which may exist.

There are a number of other rules, some of which overcome the problem where only one 'token' entry appears for a particular category or section from any State.

In the 1986 and 1987 HF Contest Championships, the outright winners in both years were Ian, VK5QX, in the Phone section, and Gil, VK3CGG/VK3CQ, in the CW section.

On page 49 of August 1989 issue of Amateur Radio the winners of the 1988 HF Contest Championship were announced. Gil, VK3CQ, had won the CW section for the third year in a row, but there was a new winner in the Phone section, Ken, VK3AJU.

However, late in August I received a call from Ian, VK5QX, telephoning from Alaska where he was holidaying. Ian's August issue of Amateur Radio had just reached him, and he was concerned that his scores in the HF Contest Championship were not correct.

Panic stations in the Executive Office! A quick grab for the results of the relevant contests as published in various issues of Amateur Radio showed that none of the published scores for the HF Contest Championship were correct! An urgent call was made to the Federal Contest Manager. He eventually agreed with our

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts
VK1	ACT Division GPO Box 600 Canberra ACT 2601	President Secretary Treasurer	Ted Pearce Jan Burrell Ken Ray	VK1AOP VK1BR VK1KEN	3.570 MHz 2m ch 6950 70cm ch 8525 2000 hrs Sun
VK2	NSW Division 109 Wigram St Parramatta NSW 2124 (PO Box 1066 Parramatta) Phone (02) 689 2417	President Secretary Treasurer	Roger Henley Peter Balnaves David Horsfall	VK2ZIG VK2CZX VK2KFU	(R Denotes repeater) Times 1100 and 1915 on Sunday 1.845 MHz AM, 3.595 AM/SSB , 7.146 AM (1100 only) 28.320 SSB, 52 120 SSB 52.525 FM 147.000 FM(R) 438.525 FM(R) 584.750 (ATV Sound) Relays also conducted via many repeaters throughout NSW.
VK3	Victorian Division 38 Taylor St Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3XLZ	1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday
VK4	Queensland Division GPO Box 638 Brisbane Qld 4001 Phone (07) 284 9075	President Secretary Treasurer	David Jones John Aarsse Eric Fittock	VK4NLV VK4QA VK4NEF	3.605 MHz, 7.118, 14.342, 18.132, 21.175, 28.400, 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Monday
VK5	South Australian Division Thebarton Rd West Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Don McDonald Hans van der Zalm Bill Wardrop	VK5ADD VK5KHZ VK5AWM	3.550 MHz, 14.175, 28.470, 53.100, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North (NT)3.555, 146.500, 0900 hrs Sunday
VK6	West Australian Division PO Box 10 West Perth WA 6005 Phone (09) 474 2626	President Secretary Treasurer	Alyn Maschette Pending Bruce Hedland - Thomas	VK6KWN VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115,14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury)147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 3.560 at 1930 hrs.
VK7	Tasmanian Division PO Box 1010 Launceston TAS 7250	President Secretary Treasurer	Mike Wilson Bob Richards Peter King	VK7ZWW VK7NRR VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs
VK8	(Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).				

Note: All times are local. All frequencies MHz.

findings, could not understand what had happened, and did not even have a computer to blame. A frantic call was then made to the trophy manufacturer to ensure that the trophies will be correctly engraved - yes, the outstanding contest trophies are currently being manufactured and engraved! - and the staff of the Executive Office relax a little and wait for the next crisis.

The end result of all this is that the results of the 1988 HF Contest Championship as published in August 1989 Amateur Radio magazine were incorrect.

Gil, VK3CQ, remains the winner of the CW section, but with a score of 30 out of a possible 40.

And, for the first time in the history of the HF Contest Championship, there was a tie for first place in the Phone section. Ken, VK3AJU, with a score of 39 out of a possible 40, and Ian, VK5QX, also with a score of 39 out of a possible 40, are the joint winners.

Operation by Licensed Amateurs Visiting New Zealand

The New Zealand Radio Frequency Service, which is the New Zealand equivalent of the Australian Department of Transport and Communications (DoTC), has just issued a policy statement concerning short-term amateur visitors to New Zealand.

Effective immediately:-

1. Licensed visitors to New Zealand may use VHF/UHF handheld transceivers on frequencies of 144 MHz and above.
2. Operation is for a period of not more than 4 weeks.
3. No application need be made to NZRFS and no fee is payable.
4. The visiting amateur must be the holder of a current licence issued by their own administration.
5. A copy of their current licence must be carried while operating and be available for inspection.
6. Usage of the transceiver must conform with the requirements of the New Zealand Radio Regulations 1987 and the general terms and conditions shown on the amateur licence schedule.
7. The visiting amateur must use their home callsign suffixed by ZL 1, 2, 3, or 4 as appropriate.

That is great news for amateur visitors to the land of the long white cloud, and I believe it is a world first.

Initial approaches to DoTC for a similar facility for amateur visitors to Australia met with a negative response. Apparently DoTC feel that the conditions prescribed in the Australian Radiocommunications Act 1983 would not enable DoTC to approve of such a concession. However, the WIA will keep trying.

Incidentally, further word from across the Tasman would seem to indicate that the NZRFS has suddenly produced a great burst of activity aimed at substantial deregulation of amateur radio in New Zealand.

20 Year Index for Amateur Radio Magazine

Because of the incredible amount of time it takes searching through annual and five year indexes of Amateur Radio when we receive a request from a member for advice as to which issue of our magazine contained an article on a particular item, we have just finished compiling a 20 year, 2059 articles, index of Amateur Radio.

It has taken many months because of the enormity of the task, and the fact that, because of the lack of human resources in the Executive Office, it had to be treated as a background task.

Although this index was compiled for the convenience and improved efficiency of the Executive Office, it has been decided to also make it available to interested members on an IBM format 51/4 inch floppy disk. The database can be supplied either in a dBase III Plus .DBF file, or in an ASCII format which can be imported into virtually any database or word processor program.

The cost of this index on disk will be $10.00, which includes the floppy disk and packing and postage. When ordering, please indicate which of the .DBF or ASCII formats you require.

Perhaps some enthusiastic member may care to extend the database back even further for us, say to 30 years, or even more?

For those members who would like a copy of the index, but do not have an IBM compatible computer, a photocopy of the 36 page hardcopy printout of the database will be available for $5.00, which will also include packing and postage.

As recently advised to members in Amateur Radio magazine and the WIA news broadcasts, the Executive Office is currently clearing out stocks of back issues of Amateur Radio. This index may be just what you need to decide which particular back issues of Amateur Radio you require.

If you want to order a copy of the 20 year index to Amateur Radio magazine, please forward your remittance to:

Amateur Radio Index, PO Box 300, Caulfield South 3162 VICTORIA.

Intruder Watch

As has been said on many occasions before, the Intruder Watch service is vital to the protection of our amateur bands, and the future of amateur radio as we know it.

Some of our intruder watchers have asked what happens to their reports. Does the government do anything about the reports?

In response to a query to DoTC, I received a letter dated 10th August 1989 from Bill May, the Acting Manager Regulatory in Canberra, which clearly explains the importance of intruder watch reports from the amateur service.

Bill wrote:

"I refer to the regular reports of intrusion into the amateur bands by non amateur stations, provided to the Department by the WIA.

I would like to say that DoTC is appreciative of the efforts by WIA members in providing the information. As you are aware, DoTC monitoring staff has been drastically reduced over the years and

continued on page 13

Notice

Attention is drawn to the article on page 31 of the September issue of Amateur Radio magazine concerning the use of 3 pin plugs in 12 volt harnesses.

The WIA is concerned that such an article was published, despite the warnings contained therein and, without being critical of the author, who took pains to emphasise the need for care, wishes to announce that editorial procedures have been changed to avoid a similar incident.

Neither the Executive, nor any organ of the WIA, would knowingly allow such an item to be published. However, the fact remains that it has been published, and morally there is an element of corporate responsibility. Accordingly, the Executive apologises for the appearance of the article.

It goes without saying that the WIA warns of the possible danger of using standard 3 pin connectors in 12 volt applications. This danger would be increased if the suggested labelling was not applied, or if the wiring harness came into the hands of illiterate persons or children.

It is strongly suggested that members mark their copies of the article appropriately. **ar**

A Simple Non-Mathematical Treatment of Transmission Lines

Dr J G Lucas VK2CJL
Air Navigation
Research Group
University of Sydney

Most books and explanations of transmission lines are, in my view, incredibly complicated and overly mathematical in their treatment of the subject! The tendency is to emphasise mathematical approaches which often hide the simple understanding of transmission line operation.

There are essentially two problems (see Figure 1) associated with using transmission lines. The first problem is effects caused by a load when it is not a perfect "match" (which is fairly typical of most amateur antennas), and the second is caused by an incorrect source impedance at the sending end of the line. We will concentrate here on the effects of the load impedance and summarise the effects of the source at the end.

All of the following comments apply to transmission lines whether they are balanced (eg parallel wire lines) or unbalanced (eg coaxial cable) or even a waveguide.

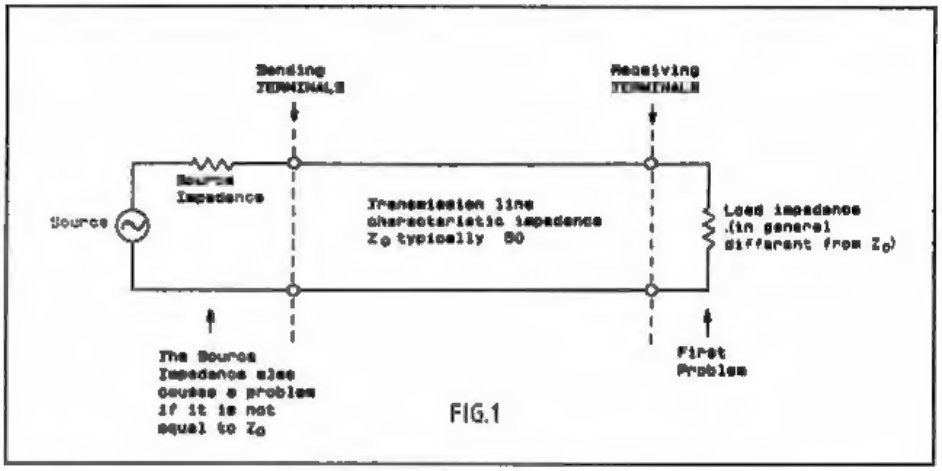

FIG.1

Characteristic Impedance

The concept of the "characteristic impedance" of a transmission line must be well understood to begin with. Referring to Figure 2 the "characteristic impedance" is defined as the impedance Z_o that we could measure (ie applied voltage divided by resultant current) looking into the input terminals of the line when it is INFINITELY long. It follows, that if we terminate a finite piece of transmission line having a characteristic impedance Z_o with this same impedance Z_o, then this is equivalent to connecting an infinite line onto the end of the finite line so that the input impedance is still equal to Z_o. At typical amateur frequencies (say up to 150 MHz) commonly used transmission lines can be accurately assumed to have a purely real (ie Resistive) characteristic impedance. 50Ω, 70Ω and 300Ω are commonly used values. For the remainder of this note it will be implicitly assumed that the characteristic impedance is purely resistive.

The Idea of "Switching On" the Transmission Line

It is helpful to visualise the sequence of events which takes place when we first switch ON a source (at one particular frequency) at the sending end of the line. Since the characteristic impedance is purely resistive then the first "wave" of voltage and current which starts off down the line must have its voltage and current in phase and the ratio V/I shown in Figure 3 will equal Z_o. One of the commonest values of Z_o which is used is 50Ω and that is the value which we shall assume exclusively here. As this voltage and current wave travels down the line the phase of the progressive wave will change with respect to the phase of the wave at the input terminals - other words, it does take a very small but FINITE time (at the velocity[1] of the wave of on the line) to travel down the line. Figure 2 shows the way we depict this and particularly the direction of rotation of the vectors for leading and lagging phase as we move down the line in the direction of the load.

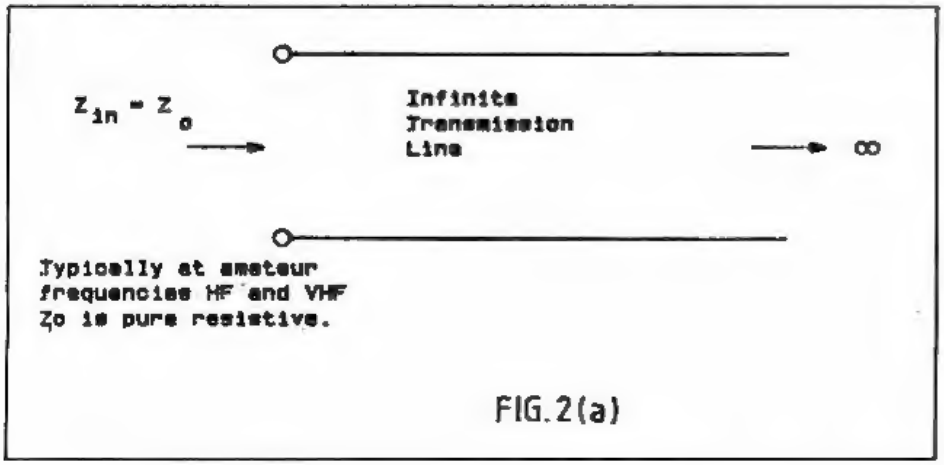

FIG.2(a)

This first wave travelling down the line will think it is travelling down an infinite transmission line until it encounters a termination at a finite distance. As shown in Figure 3, this incident wave will proceed into the load and if Z_{load} is equal to the characteristic impedance (say 50Ω) the wave will be completely absorbed by the load. For ANY other value of load impedance different from 50Ω a REFLECTED wave will occur and this reflected wave will travel BACK from the load towards the generator.

Total Reflection Situations

To start off with, let's consider some different examples where the total incident wave is reflected back down the line towards the sending end.

1. Total Reflection by an Open Circuit at the end of the Transmission Line.
   The open circuit situation is shown in Figure 4. None of this power in the incident wave can be absorbed so it will all be reflected back down the line towards the generator. We would expect to measure a different open circuit voltage and no current at the load terminals. The reflected current must, therefore, exactly cancel the incident current. The reflected wave is travelling on a 50Ω line so there will be an associated voltage with the reflected current such that |Vref/Iref| = 50Ω. The vertical bars denote the magnitude of the quantity inside. We can deduce that the only possible arrangement of incident and reflected waves which gives the required result is that shown in Figure 4. The shape of the reflected wave has current and voltage exactly opposed to each other, but the MAGNITUDE of the ratio Vref/Iref must still equal 50Ω. This gives a voltage of 2Vinc.
2. Total Reflection by a Short Circuit at the end of the Transmission Line:
   This situation is shown in Figure 5. Using the same logic as in the open circuit case, we would expect zero voltage and a doubling of current at the load terminals. It is clear again, that the arrangement of the reflected voltage and current wave has exactly the same shape as in the open circuit case. It is only the orientation of the reflected wave with respect to the incident wave which is different in the two cases!
3. Total Reflection due to any Pure Reactance Load at the end of the Transmission Line:
   The situation is now shown in Figure 6.

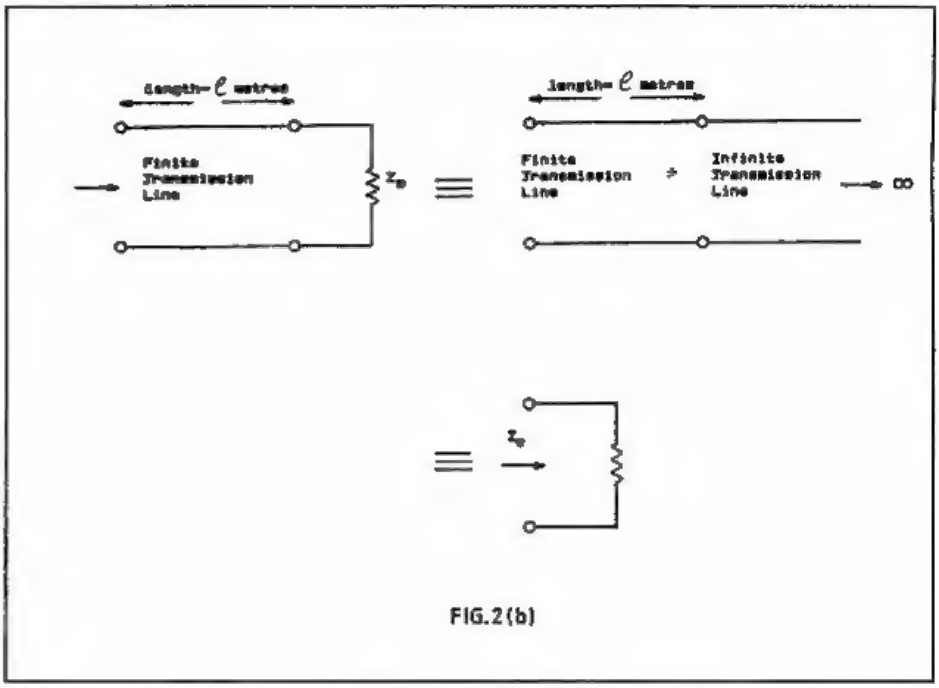

FIG.2(b)

This is, again, a total reflection situation but the incident and reflected vectors are no longer in line. When the (vector) resultants of voltage and current are found, it is clear the V lags I, so this particular load is capacitive. Any value of capacitance can be obtained simply by rotating the position of the reflected voltage vector in the right half plane. For inductive loads the reflected voltage vector is simply on the left hand plane.

Now let us move on to some simple Partial Reflection Situations:

(1) Load = purely resistive = $^1/_2$ the characteristic impedance (say 25Ω).

This situation is shown in Figure 7. The reflected wave is now needed to reduce the TOTAL voltage and increase the TOTAL current such that the ratio Vtotal/Itotal = 25Ω. The necessary arrangement to achieve this is also shown in Figure 7 and it can be seen that the magnitudes of the reflected wave are smaller than the incident but still obey the ratio of magnitudes:

$$\left|\frac{\text{Vreflected}}{\text{Ireflected}}\right| = 50\Omega$$

Here, again, the vertical bars denote the magnitude of the quantity inside.

To find the size of the reflected wave let:

Vreflected = X * Vincident Where X must be a fraction between 0 and 1!

It follows that:

Ireflected = X * Iincident

From Figure 7 we can thus deduce:

$$\frac{\text{Vtotal}}{\text{Itotal}} = \frac{\text{Vinc-X Vinc}}{\text{Iinc+X Iinc}} = \frac{\text{Vinc(1-X)}}{\text{Iinc(1+X)}}$$

And this must equal 25Ω.

$$50\ \frac{(1-X)}{(1+X)} = 25$$

Therefore, $X = {}^1/_3$

The complete multiplier that gives the reflected wave from the incident wave is called Voltage Reflection Coefficient and it also includes the angle between the incident and reflected waves.

Let's call this complete multiplier *K*. For the case we have just considered it should be clear that $K = -{}^1/_3$

Or alternatively $K = {}^1/_3$ at 180°

So we can see that the "Reflection Coefficient" contains both the magnitude AND the phase modifier needed to transform the incident voltage to the reflected voltage!

(2) Consider another partial reflection situation where the terminating load is purely resistive and equal to twice the characteristic impedance, ie 100Ω.

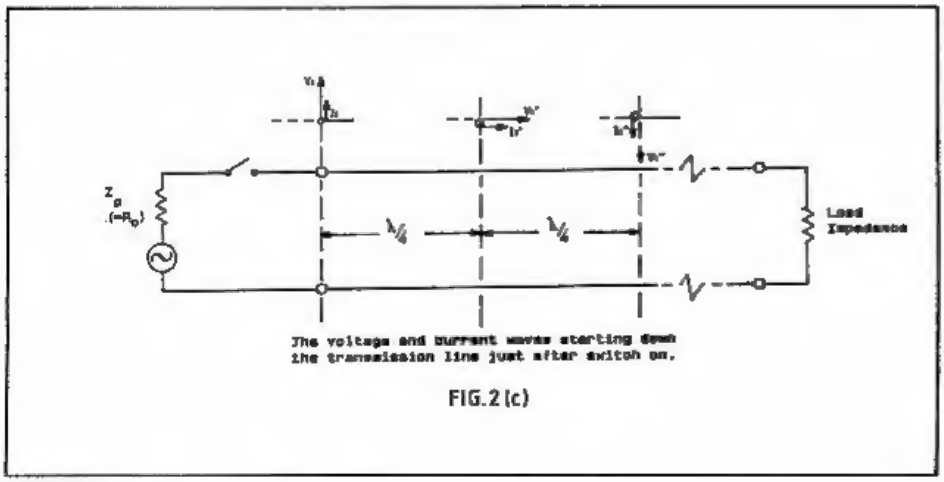

FIG.2(c)

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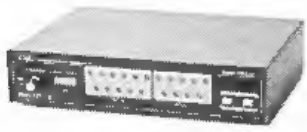

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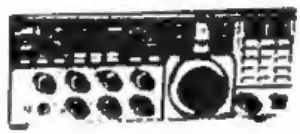

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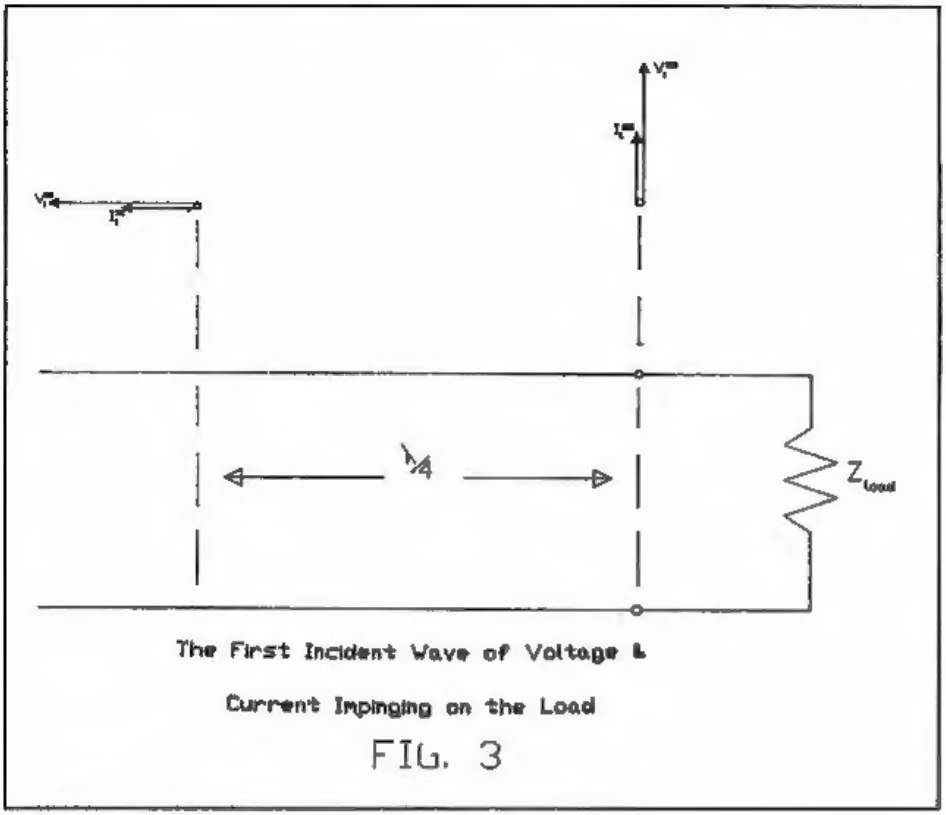


The First Incident Wave of Voltage & Current Impinging on the Load

FIG. 3

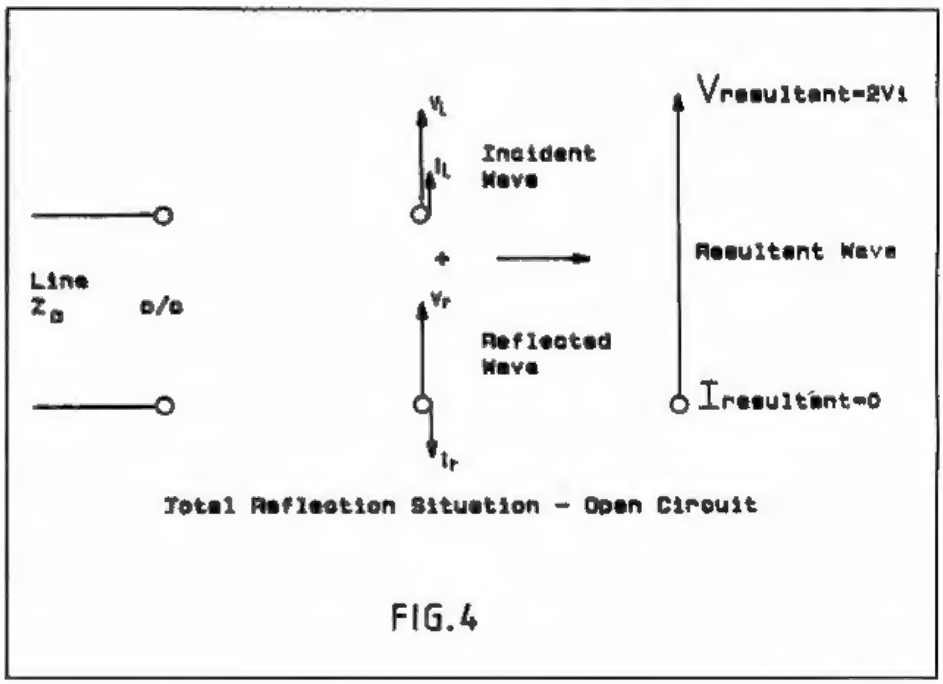
The receiving end situation is then shown in Figure 8.

In this case the Reflection Coefficient $K = +1/3$ or $1/3$ at 0°

The Behaviour of the Reflected Wave Back Down the Line

We shall use the 100Ω load example shown in Figure 9 to follow the reflected wave as it moves away from the load. In this Figure the progressive INCIDENT wave is depicted **above** the drawing of the transmission line while the progressive REFLECTED wave is shown **below**. It should be clear that this incident wave lags (rotates in a clockwise direction) with respect to the sending end phase as it approaches the load. Alternatively, this is equivalent to the incident vector **leading in phase with respect to the load terminals** as we move away from the load termination back towards the generator.

Now the Reflected wave caused by the mismatched load actually starts at the load terminals so that it must LAG in phase **with respect to the load terminals** as you move back towards the generator end. The phase rotation of this reflected vector must, therefore, be exactly the opposite way to that of the incident vector as we move away from the load. At a point one eight of a wavelength back from the receiving terminals the wave vectors will have the positions shown in Figure 9 and will continue to rotate as shown by the arrows as we move further back down the line towards the generator.



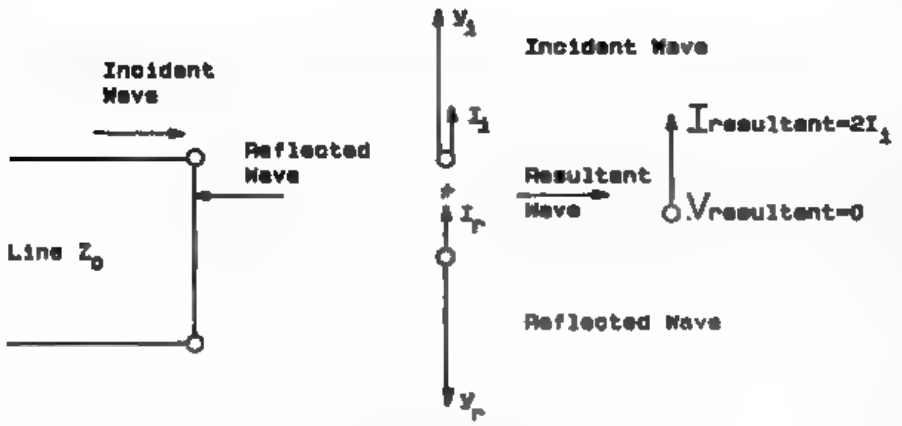
Total Reflection Situation - Open Circuit

FIG.4

At any point on the line the incident and reflected components of voltage can be vectorially added (current vectors similarly) and the effective impedance which exists at that point on the line could be evaluated, by evaluating the ratio of the resultant voltage vector and resultant current vector and taking due account of phase. It is important to see that this impedance is changing continuously as we move along the line. It will pass through points where the voltages add in phase (and the currents subtract) which have a **maximum** pure resistance value and also throughpoints where the currents add in phase (and the voltages subtract) which have a **minimum** pure resistance. In other words, we are simply describing the Voltage Standing Wave pattern (often referred to as the VSWR) which exists on the transmission line when it has a mismatched load!

This all sounds like a lot to have to remember! However, there is a classically simple graphical aid called the **SMITH** chart which does ALL the hard work for you. The beautiful simplicity of the Smith chart is often thoroughly obscured in its mathematical development! That development is completely unnecessary! You ONLY need to know that it is a chart of REFLECTION COEFFICIENT! The Smith chart ALWAYS normalises the incident Voltage wave vector to be the radius AB in Figure 10 and this lets you simply plot the reflected voltage vector just as we have done up to now.

Let's take an example of a transmission line which has a 50Ω characteristic impedance and is terminated with a load of (100 - j100)Ω - this is physically equivalent to a resistance and a capacitance in series. The first step is to "normalise" this load to the characteristic impedance so that:



Total Reflection Situation - Short Circuit

FIG.5

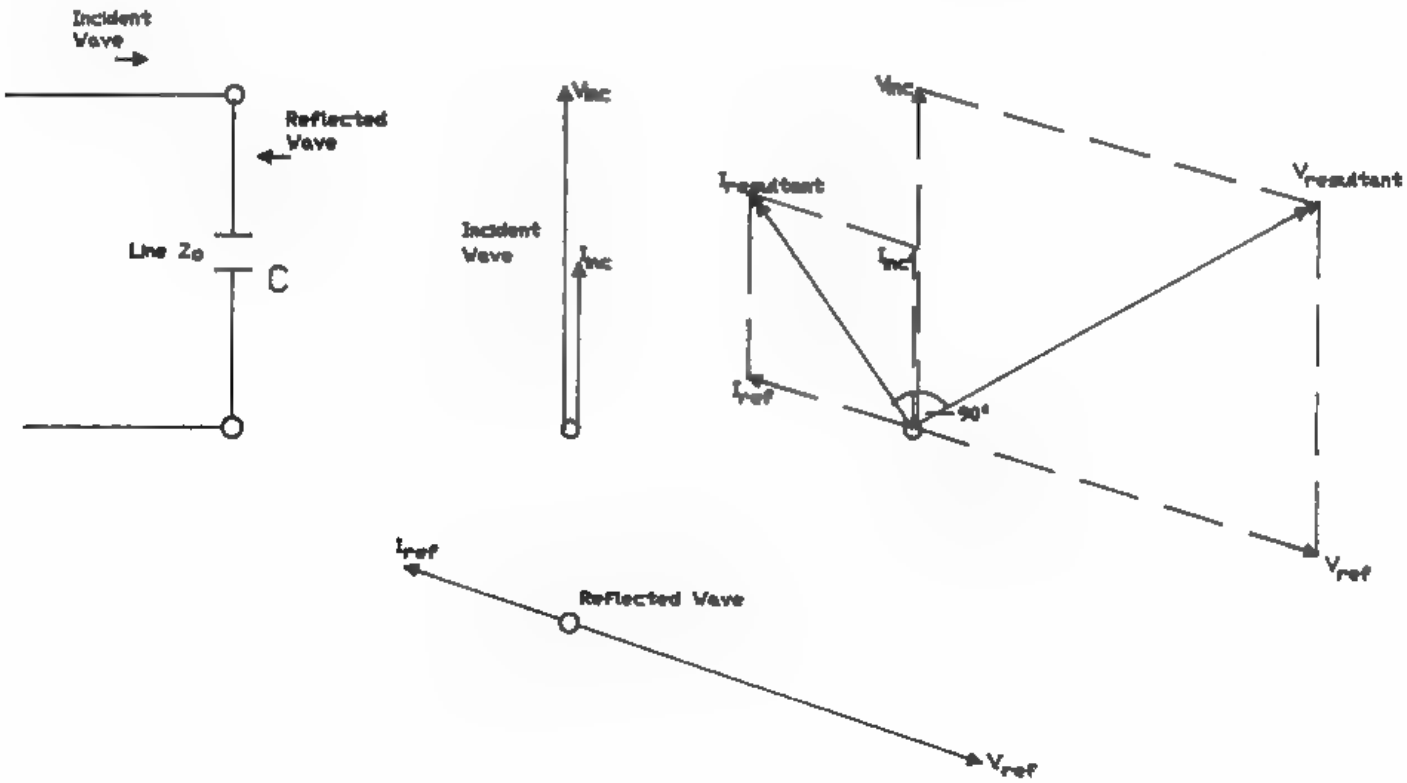
Z loadnormalised

$$= \frac{R}{Zo} + j\frac{X}{Zo} = \frac{100}{50} - j\frac{100}{50}$$

$= (2 - j2)$ "normalised" Ohms

We plot this value on the Smith Chart in Figure 10 by finding the intersection of the $-j2.0$ arc (ie 2.0 on the "capacitor reactance component" edge of the chart) with the 2.0 arc (through 2.0 "resistive component" on the horizontal scale across the diameter of the chart.)

We immediately have the arrangement of incident and reflected voltage wave vectors at the load terminals! Now as we move back down the transmission line (which we shall assume to be lossless) the reflected vector rotates on a circular arc. Because the incident vector has been frozen to always lie along AB it is clear that this reflected vector has to rotate twice as fast to maintain the expected result. The distance scales around the circumference of the Smith chart take care of it all for us in any event!



Total Reflection Situation - Pure Capacitive Reactance

FIG. 6

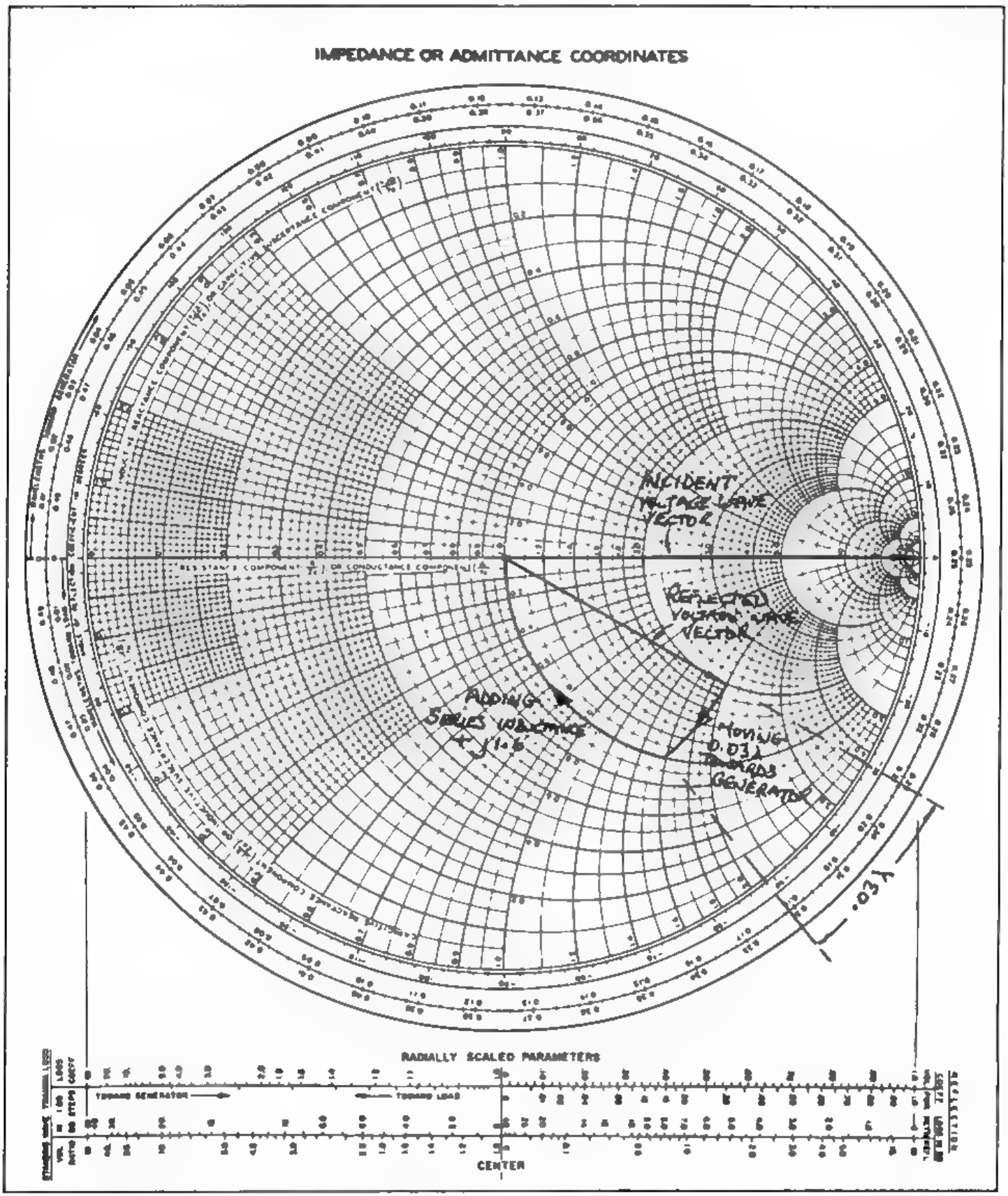


Figure 10. Smith Chart

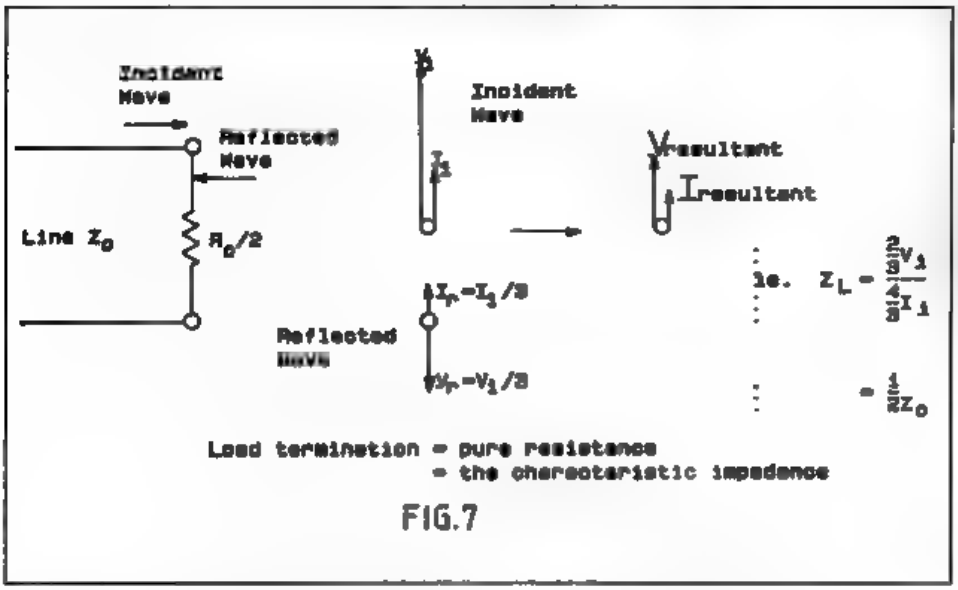


FIG.7

For any of our practical operations we simply want to remove the reflected wave completely and then the line will be perfectly matched. For the mismatched load example in Figure 10 we can completely eliminate the reflected wave by moving down the transmission line (away from the load) towards the generator (ie on a concentric arc on the Smith Chart) to the point C which lies on the 1.0 resistor component circle and there insert a series inductance of value +/ 1.6. This will take us to the centre of the Smith Chart eliminating the reflected wave and giving a perfectly matched transmission line.

The Problem with a Mismatched Source

At the beginning it was mentioned that the source generator should also be matched. This important step is often overlooked, but it should be quite clear that if a line has a mismatched load then any reflections which arrive back at the source generator will be reflected back towards the load if the generator does not present a good match to the line. Such a source reflection really complicates the operation of a transmission line and should be avoided wherever possible!

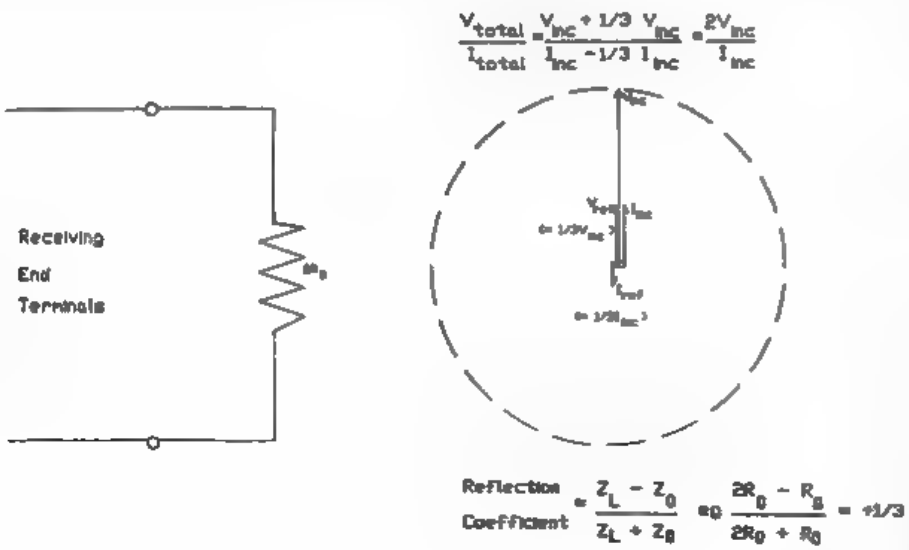
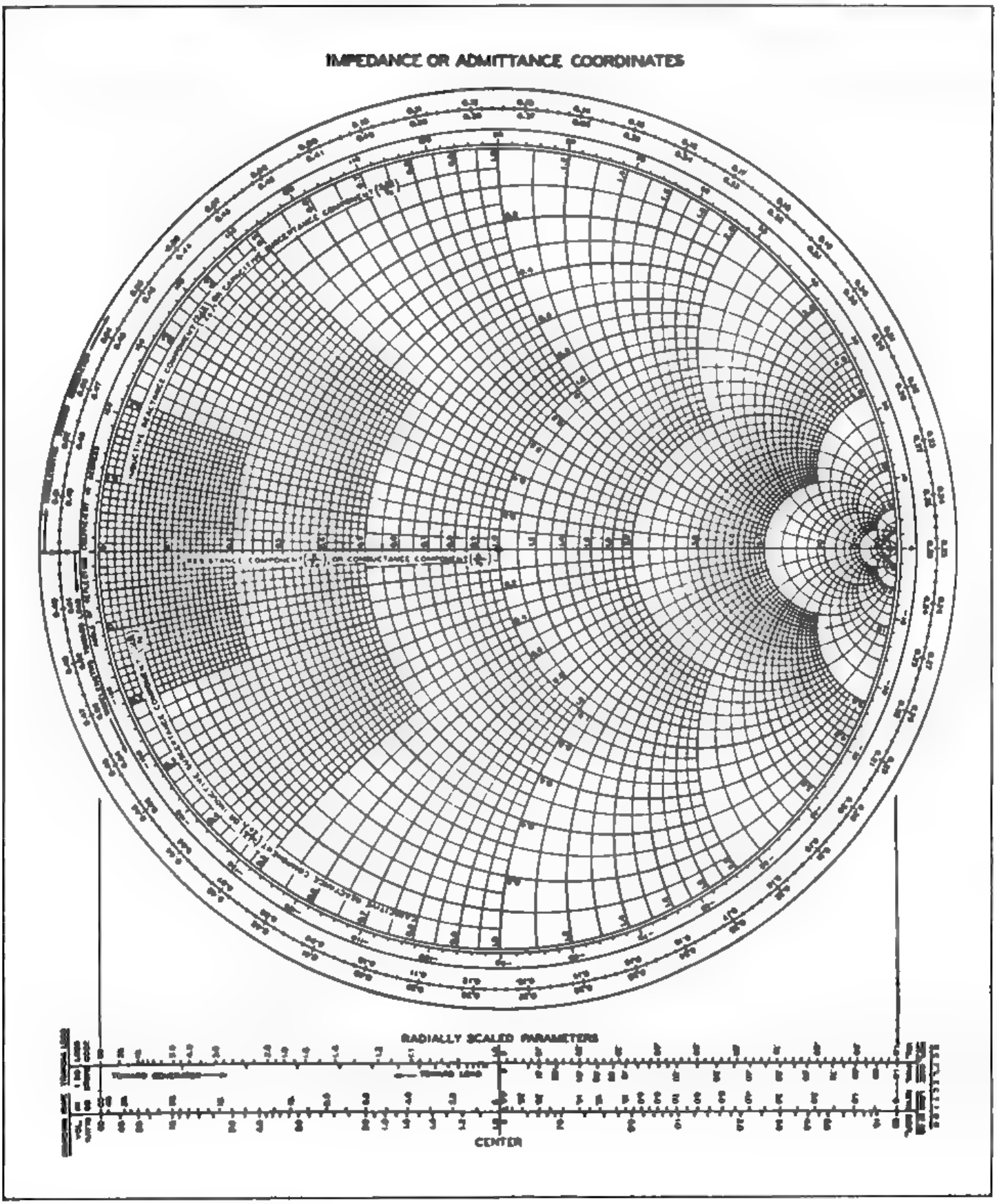


FIG. 8



Blank Smith Chart for Reader's use.

Conclusion

On getting to this point you might ask:

1. Can we really understand and cope with transmission lines without ANY mathematics AT ALL? The simple answer is yes. The mathematics really do not add any further understanding (but you do need some mathematics to properly analyse the mismatched source situation.)
2. Do we get enough accuracy reading quantities off the Smith chart compare with the four places of decimals that a computer or calculator will give us? In practice, the precision of the Smith chart reading is generally as accurate as you can cut a transmission line (or know its dielectric constant etc!).

Once transmission line ideas are mastered, you will find that Scattering Parameters are a straightforward extension of these ideas. They are important because they are the only parameter set which can be accurately measured at frequencies above a few MHz.

[1] This is the velocity of light, "c" in an air spaced line - less than c in dielectric filled coax or a waveguide.

Acknowledgements

I am indebted to Frank Butler VK2ZRB for doing such an excellent job of reproducing the Figures for this article from very rough sketches. I would also like to thank John Gibling VK2EKG for his thoroughly constructive criticisms of the final draft.

Short Profile on Dr J Godfrey Lucas

Godfrey Lucas came to Australia (from Northern Ireland) Christmas 1968. He leads the Air Navigation Research Group in Sydney University which works on the Landing Systems, En-route navigational aids, Primary and Secondary radar and Satellite systems with recent special interests at L-band. He got his amateur licence about three years ago but hasn't been able to find much time to go to air! ar

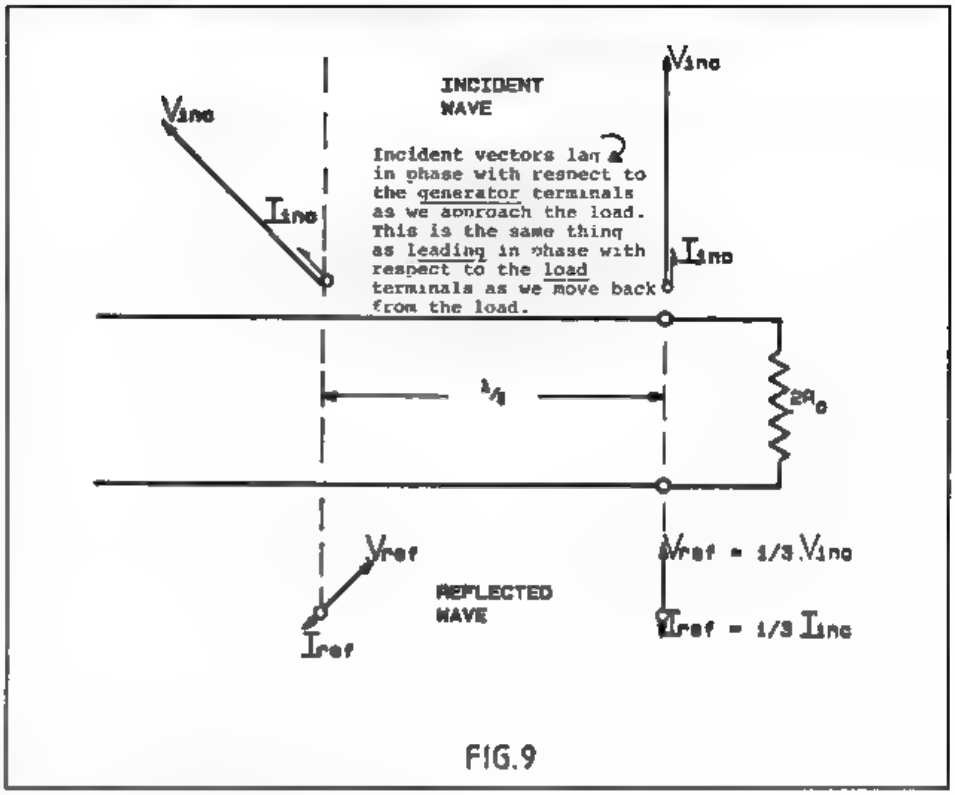


FIG.9

WIA NEWS *continued from page 4*

we are faced with the task of having to make the hard decisions of where to allocate the resources in the most effective way. I can assure you that you are certainly providing a valuable service in that part of the spectrum which is regarded as being self regulating.

With regards to the Intruder Watch reports, DoTC actions all instances where the intruder is identified as an Australian station. A recent report mentioned Townsville Radio (VIT) as an intruder. OTC was contacted and although a thorough investigation was undertaken, no explanation could be given.

Any intrusion by overseas stations is difficult to curtail. Although it may be reported to the country concerned, it is up to that country to take corrective action. In many instances, they have acknowledged that because of resource constraints they are unable to do anything. The intruders from Indonesia, China and Russia are still occurring despite repeated approaches. However, DoTC is still continuing its' efforts in regard to these matters.

It would be of immense value to DoTC in tracking down any intruders if the "comments" of the intruder report could include

continued on page 18

An Introduction to Synchro Torque Transmitters and Indicators

(Selsyns to you and me)

Dean Probert VK5LB
RMD Verrall Road
Hope Forest 5172

Part One

Introduction

Recently an advertisement published in AR for the author, who wanted a pair of selsyns, brought a varied amount of interest in the subject to light. The author had a large number of responses to the advertisement from people both wanting to sell selsyns and those wanting information about them.

The author obtained two transmitters and two receivers fro $5.00 each making a total of $20.00 outlay. That is the going price for good selsyns in South Australia at the moment. Numerous interstate telephone calls were received also. Some had selsyns to sell but the majority wanted information, on every imaginable subject concerning selsyns. The author had, as it happened, obtained a large amount of information concerning them prior to placing the advertisement. The following may be of use to those persons who need a means of indicating beam headings or similar functions.

What is a Synchro?

A simple synchro system is easily understood if it is thought of as an electrical equivalent of a long shaft or cable which transmits motion from one point to another. If a shaft has a pointer at both ends then, when the shaft is rotated 180 degrees, the pointer at one end will be in the same position as the other, provided they were the same when you began.

Figure 1

It is not practical to have either a shaft or a flexible cable running from a beam on a tower down to the shack to indicated beam headings. To overcome this problem of transmitting dial readings over a long distance a synchro transmitter and suitable receiver can be used When two synchros are connected together, and to a source of AC voltage, they form a synchro system.

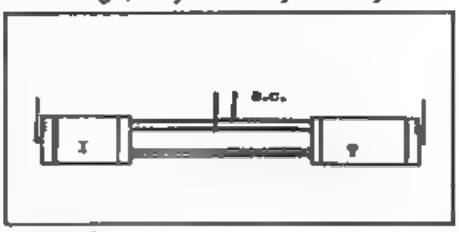


Figure 2

A simple synchro system can be used to turn light loads such as dials and pointers. If more torque is required to turn a heavier load, then additional components will be required. For beam headings, a transmitter at the beam and an indicator in the shack will be sufficient. In such a system, when the shaft of the transmitter is turned by the rotator on the tower, an electrical signal is generated and transmitted to the indicator. This signal acts upon the indicator rotor causing its shaft to rotate exactly the same number of degrees as the transmitter shaft.

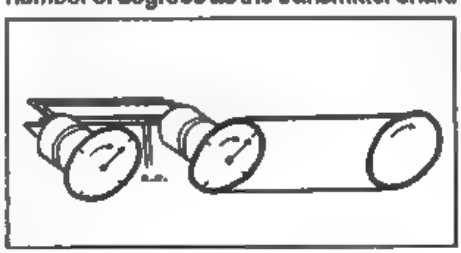


Figure 3

Synchro Torque Transmitter Construction

The synchro is very similar in construction to an ordinary motor or generator. It has two main parts, a stator and a rotor. The stator winding is actually three separate windings spaced 120 degrees apart. Three leads, one from each of the windings, are connected together to form a common connection. The remaining three leads are brought out to external connections marked 1, 2 and 3 on the back of the unit. Each connection is wired to a similar numbered connection on the corresponding synchro. The AC leads are marked X and Y and the same applies.

Figure 4

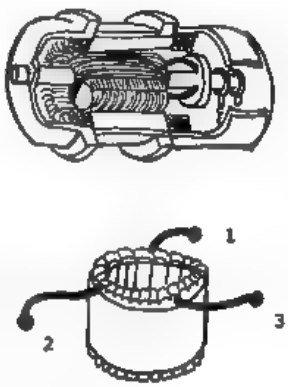


Figure 5

These three windings are connected in what is called a star connection. The diagram shows the schematic symbol representing the stator windings.

Figure 6

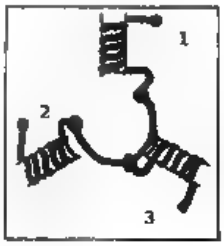


Figure 7

The rotor is made up of two coils connected in series forming a continuous winding. These coils are wound on a laminated, bobbin shaped iron core to form the com-

plete rotor assembly Bearings support the rotor at each end and the electrical connections are made by means of two slip rings on the rotor shaft. Two brushes bear against the slip rings. When the rotor is fitted inside the shell containing the three star windings, 1, 2 and 3, it is free to turn. Current is supplied to the rotor windings by the leads marked X and Y. This current is from an AC voltage source. The complete torque transmitter schematic is illustrated in Figure 9.

Figure 8

Figure 9

Synchro Torque Indicator

The synchro indicator (or receiver) is similar to the synchro transmitter both in construction and electrical operation. The stators are exactly alike. The rotors are also alike, except that the rotor of the indicator has a heavy metal flywheel, called a damper, mounted on one end of the shaft. The purpose of the damper is to prevent the shaft of the indicator from oscillating or spinning at high speed. Without the flywheel, this would happen when the shaft was turned suddenly or when the power was first turned on

There are a couple of different methods of using the flywheel effect. The flywheel may be mounted on the shaft so that it turns for 45 degrees independently of the shaft but then is stopped by a keyway. The shaft to flywheel fitting has a friction disc fitted in such a way as that it turns on the shaft with a certain amount of friction. When the shaft turns suddenly the inertia of the flywheel tends to resist the the turning movement. The keyed bushing, hitting against the flywheel acts as a brake and, thus, the shaft never gets going fast enough to start oscillating or spinning

Another form of flywheel is the L shaped soft iron rotor which is balanced so that its equilibrium position is independent of gravity. The stator winding is a three phase winding as previously described. To obtain self alignment without an energised rotor, a fixed polarizing coil is connected to the same AC supply used to energise the transmitter rotor. In effect, magnetic slip rings are used instead of electrical slip rings. The vane rotor is effectively an AC magnet having a definite polarity in relation to the AC supply and, therefore, aligns itself with the stator field.

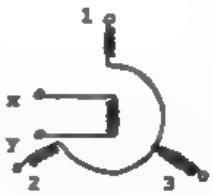
There is no reason why a synchro torque transmission system cannot be set up using two transmitters for beam indication purposes. The beams are generally rotated at about one rpm and so sudden start-up or stops are not of concern.

The needle movement of a transmitter which is used as an indicator is not as sharp or swift as the transmitter and indicator combination. They "chug" a bit when rotating but do still work, and they have plenty of torque.

The author could not get two indicators to work when connected as transmitter and indicator.

Figure 10 shows the schematic symbol of both the transmitter and receiver synchros but drawn in a different interpretation to Figure 9. They are essentially the same though. From describing how synchros are constructed, we may now move on and discuss how they work.

Figure 10



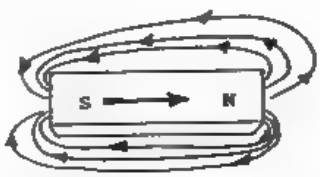


Figure 11

Magnetic Fields

Looking at Figure 11 probably brings back some theory half forgotten. Magnetic lines of force flow from the South pole to the North pole within the magnet.

Now, consider two bar magnets, one of which is permanently fixed in place and the other which is free to rotate about a central pivot. If the free bar magnet is rotated until its north pole is facing the north pole of the other magnet, a strong force of repulsion is set up. Like poles repel each other.

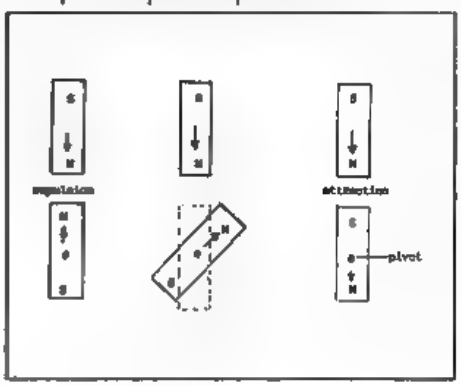


Figure 12

So, when the magnetic fields are in opposition (repulsion) a strong force exists between the two fields. Similarly when the fields are aiding each other (attraction) a strong force, attracting this time, exists.

Suppose we have three magnets as in Figure 13, of equal strength spaced 120 degrees apart, with all being pivoted so as to be free to swing. The individual magnetic fields of the three outer magnets act on the inner magnet so that the combined fields of the outer magnets form one resultant magnetic force field.

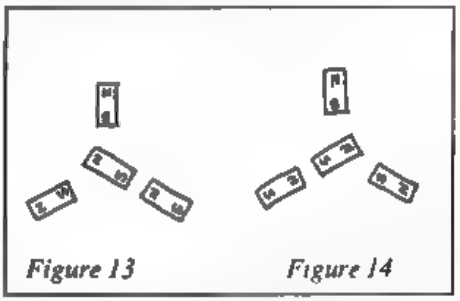


Figure 13 *Figure 14*

If the bottom two magnets are reversed so their fields are reversed then the combined magnetic fields of the three outer magnets act on the inner magnet as in Figure 14.

Simple Transformer Theory

Looking at Figure 15, one cannot help but see four windings on magnetic cores These windings make up the stator and rotor of the synchro as described If an AC voltage is applied to the rotor of a synchro transmitter, an alternating magnetic field will be built up about the rotor winding. This alternating magnetic field will cut through the turns of the three stator windings and, by transformer action will induce a voltage in them. The rotor and the stator windings of a synchro act just like the primary and

secondary of an ordinary transformer. If we apply AC voltage to the rotor in Figure 15 a magnetic field is induced. Now Lenz's law states that whenever a magnetic field cuts through a coil and induces a voltage in the coil which causes current to flow, that current will, in turn, generate its own magnetic field, and this field will oppose the original inducing magnetic field. That is, if a load is connected to the secondary winding. In other words, the magnetic field generated in the secondary will act in exactly the opposite direction to the primary magnetic field.

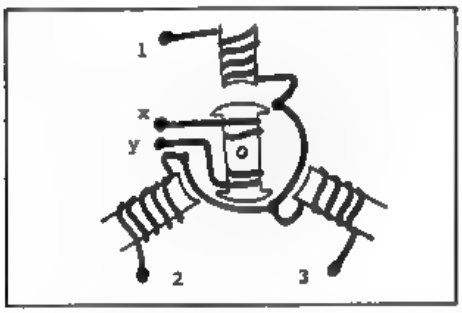


Figure 15

The direction of the primary field in Figure 16 is upward but the direction of the secondary magnetic field is downward because the current flowing in the secondary has been caused by the cutting action of the primary magnetic field.

How the Synchro Transmitter-Indicator Team Works

If we connect as a load across the three stator windings of a transmitter the stator windings of a synchro indicator the magnetic field generated by the current in the transmitter rotor will induce a voltage in each of the stator windings by transformer action and will cause currents to flow. These flowing current in the three windings will combine to form one resultant field as in the case of the three bar magnets.

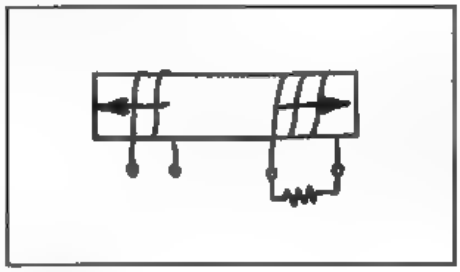


Figure 16

Notice that this resultant magnetic field is in the opposite direction to the original magnetic field of the transmitter rotor. This is correct according to Lenz's law which states that the resultant magnetic field must always oppose the inducing magnetic field of the rotor. If the rotor of the transmitter is turned to any angle, the resultant magnetic field of the stator will always oppose the magnetic field of the rotor.

Note that in Figure 19 the rotor has turned 60 degrees clockwise. So the magnetic fields which exists on the stator and the rotor of the transmitter at this time are opposed to each other. Looking at Figure 18 you will see that currents flowing in the stator windings of the transmitter are also flowing in the stator windings of the indicator.

If you turn the rotor 30 degrees clockwise, its magnetic field will be at an angle of 30 degrees to the top winding. According to Lenz's law, the resultant magnetic field of the stator must oppose the rotor magnetic field. The stator magnetic field will, therefore, also "rotate" 30 degrees so that it still opposes the rotor magnetic field.

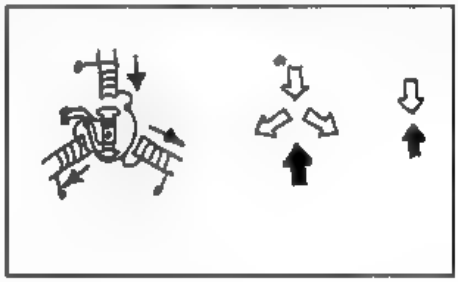


Figure 17

Since the currents flowing in the indicator stator are equal, but opposite in direction, to the currents flowing in the transmitter stator, the resulting magnetic field generated in the indicator stator will oppose the transmitter stator field, and will line up with the transmitter rotor field If we know that the indicator stator field and the transmitter rotor field always line up with one another, we can be sure of knowing the direction of the indicator stator field once we know the direction of the transmitter rotor field.

If we now place the indicator rotor in its place and the rotors of both transmitter and indicator are connected in parallel as shown in Figure 21, the magnetic fields of both rotors will be in phase - that is, the fields will always be in the same direction

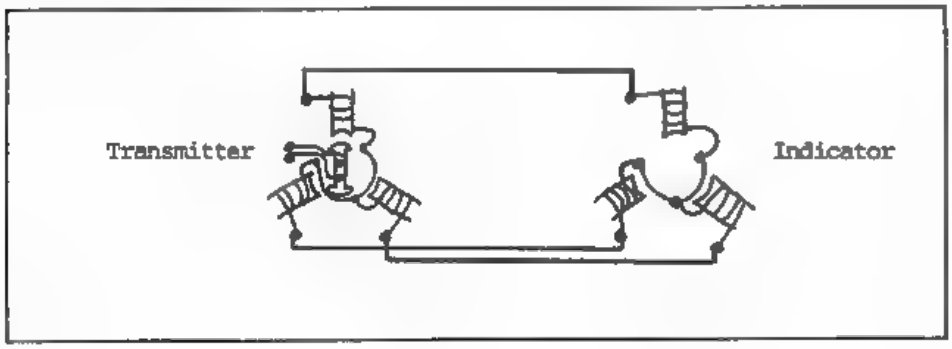


Figure 18

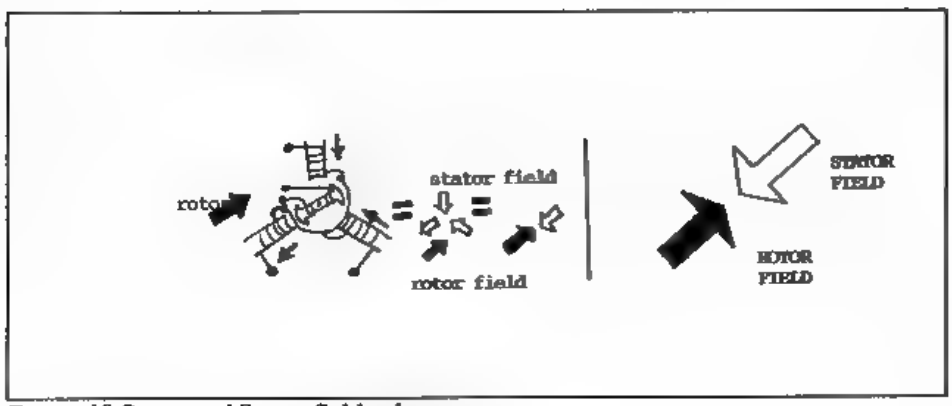


Figure 19 Rotor and Stator fields always oppose

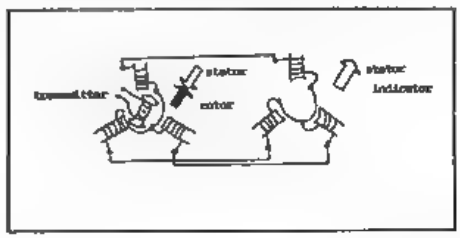


Figure 20

If the rotor of the transmitter is suddenly turned 30 degrees clockwise, the first result will be that the stator field of the indicator is suddenly "displaced" 30 degrees from

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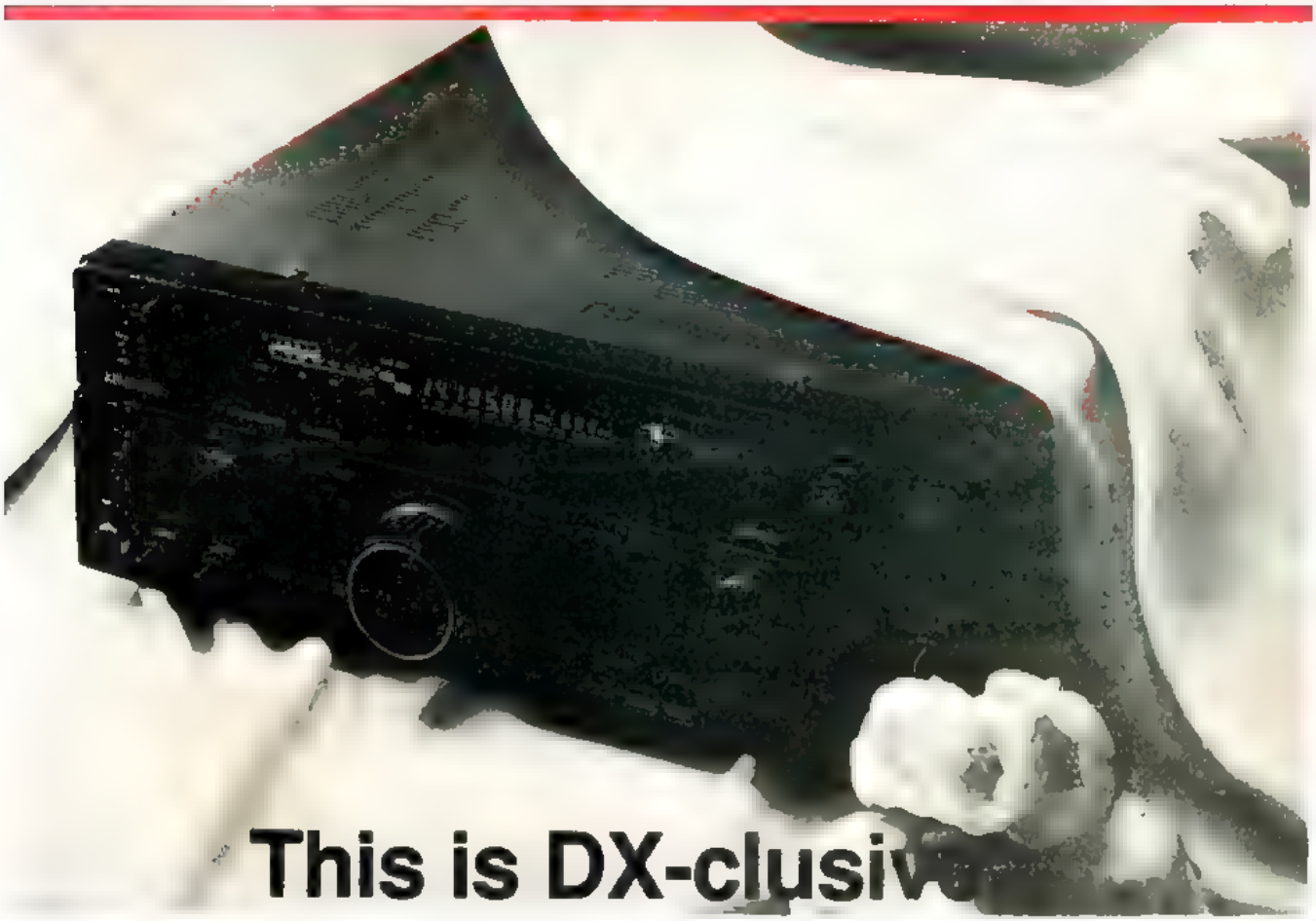

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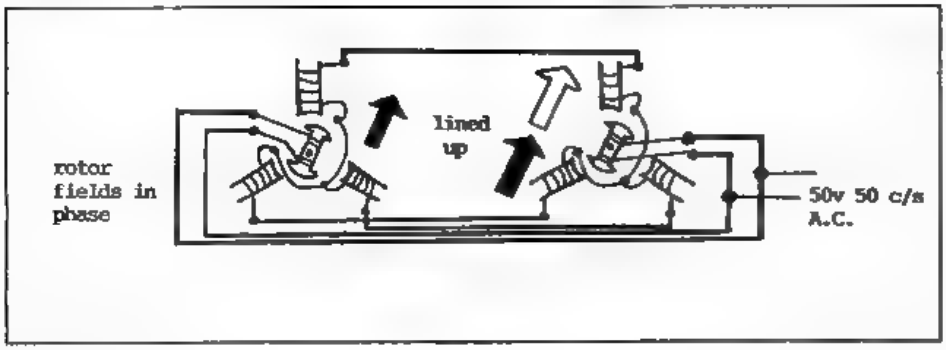

Figure 21

its rotor field. Since the two magnetic fields in the indicator will then be out of line, a strong force of attraction will exist which will tend to bring the magnetic fields back into line, with the rotor of the indicator turning until the stator and the rotor fields again line up. We now can see that to whatever position the transmitter rotor is turned, to that position the indicator rotor will quickly follow.

Summary

When a torque synchro system is used to transmit a signal, a movement in the transmitter rotor causes a corresponding movement of the rotor in the synchro indicator. The rotor of the synchro indicator will always duplicate the position of the rotor in the synchro transmitter. What actually happens is that the movement of the transmitter rotor changes the current flowing in the transmitter stator windings, and therefore changes the direction of the stator field. The stator windings of the indicator carry the same current as the stator windings of the transmitter; so movement of the transmitter rotor field also changes the stator currents of the indicator, and therefore the direction of the stator field. The indicator rotor (which is energised from the same source as is the transmitter rotor) then aligns itself with the indicator stator field. The result is that the rotor of the indicator will always turn with the rotor of the transmitter. The author apologises for the rough drawings, but he is no draughtsman. The explanation is a little long winded but worth the effort.

Part Two will contain a review of the author's fun and games setting the transmitter and indicator up to operate and the method of obtaining the correct voltages and phasing.

Also included will be a list of serial numbers which are stamped on the case of selsyn torque transmitters and indicators. There are many different types of selsyns which are not suitable for beam indication purposes and a run-down of these will also be provided. In the meantime, remember that it is not impossible to obtain a pair of selsyns, nor is it difficult to set them up for beam indicating purposes. Prices may vary in different states. The author was offered some new units which may attract a higher price, but that is up to the horse-trader in you. All the author did to obtain his units was to place a WANTED ad in Amateur Radio, so don't say that you don't get value for your yearly subscription. The author does and that is why he can be bothered writing articles for AR, which, incidentally, take quite a lot of time. ar

WIA NEWS *Continued from page 13*

more information. Also, if another column could be added to indicate how long the intruder was present. As you can appreciate, it is impractical to investigate a single occurrence of short duration as it can consume valuable resources with no results. It is best to concentrate on those instances that are continuous or occur regularly.

A strategy which the WIA might consider is to have groups responsible for particular segments of the band. This would share the load and provide the additional information required.

Next year, DoTC will be in a better position to identify and locate the difficult intruders like the RTTY stations etc as we are purchasing a number of high frequency direction finding systems. These will be strategically located around Australia and should enable us to pinpoint intruders."

As you can see from that letter from DoTC, the Department does take intruder watch reports seriously. The suggestions made by Bill May for possible expansion of our reporting are currently being considered by the WIA Federal Intruder Watch Co-ordinator, Gordon Loveday, VK4KAL.

Experimental Atmospheric Sounding Radar in the Darwin Area

Recently the DoTC issued an experimental licence to the Bureau of Meteorology for operation of a VHF atmospheric radar installation in Darwin. This radar station forms part of an international collaborative program of meteorological research for remote sensing of the upper atmosphere, other stations having been established at Christmas Island, Alaska and Pohnpei, with further installations planned for Indonesia and Peru.

The matter of concern to the amateur service is the fact that the radar transmissions will be on a centre frequency of 49.92 MHz, with an RF bandwidth of 0.5 MHz, an average power of 2 kW, and a peak power of 80 kW.

The WIA has been advised that an important parameter of this international program is the operating frequency, which needs to be in the order of 50 MHz to match the scale of the atmospheric disturbances being observed.

The antenna for the radar comprises a phased array which is flat against the ground and gives a narrow beam which points vertically, with the least possible radiation horizontally.

In advising the WIA of this experimental radar station, DoTC informed us that they have requested the Bureau of Meteorology not to continue with this experiment any longer than necessary.

DoTC have obviously taken note of the concerns of local amateurs about the operation of this radar installation, even though the amateur service is the secondary service in the 50 to 52 MHz band. A condition of the licence issued to the Bureau of Meteorology is that there is no protection from interference, and in this regard no amateur need be concerned about any of their transmissions causing interference to the radar installation.

If operation of the radar service causes interference to the amateur service, then DoTC would like to make a value judgement about it before taking any action.

Both the WIA and DoTC would appreci-

Continued Page 28

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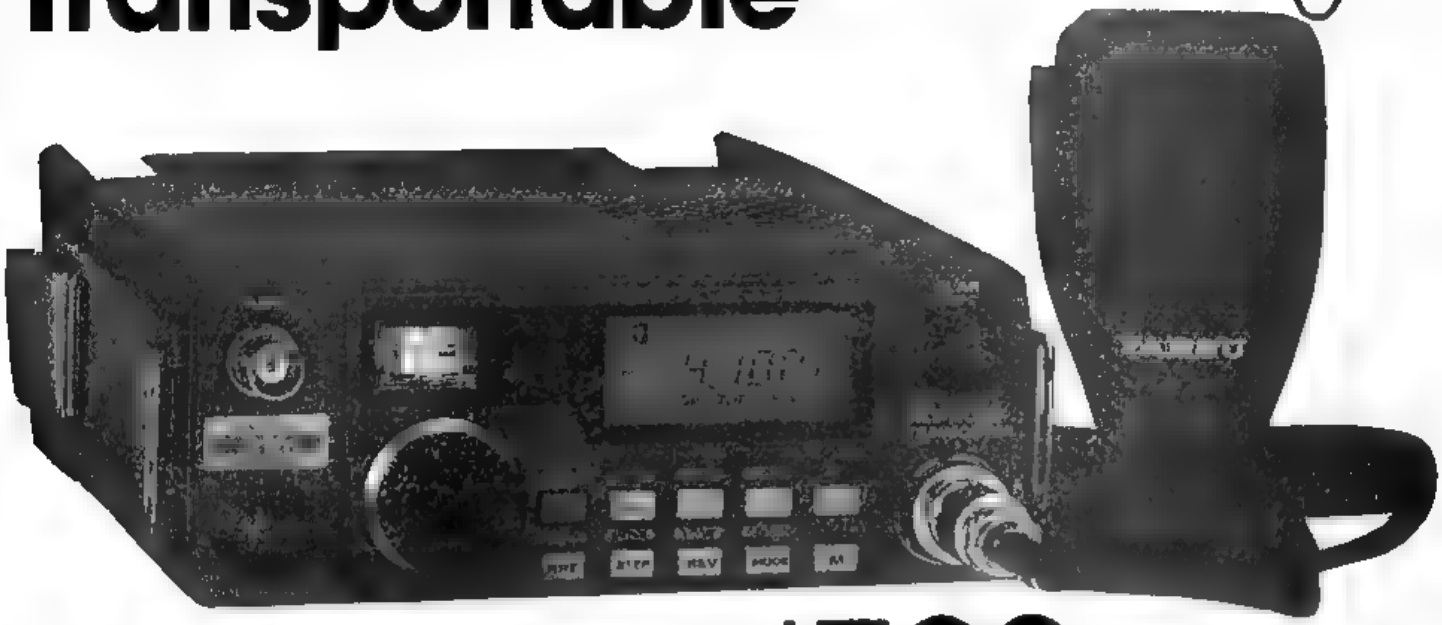

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Transmission Lines - Measurement of Their Characteristics

Lloyd Butler VK5BR
18 Ottawa Ave
Panorama 5041

Transmission lines have many applications in the fields of radio and telecommunications. In amateur radio, their most common application is in the coupling of energy between antenna and transmitter or receiver. Their performance is defined by various electrical characteristics and this article discusses the measurement of some of these characteristics.

Introduction

The theory of transmission lines is introduced in most amateur radio handbooks and it is not proposed to iterate on all that theory here. For our purposes, it is sufficient to introduce some of the most important constants and characteristics such as the electrical line constants, characteristic impedance attenuation per unit length and velocity factor with an aim to discuss how these constants and characteristics can be measure.

Transmission lines can be balanced (eg: open wire lines) or unbalanced (eg coaxial cable). The constants, characteristics and measurements discussed in the following text apply to both types of lines.

Of most interest to the radio amateur are short transmission lines which connect a transmitter or a receiver to an antenna. The need to determine characteristic impedance often arises with that length of unknown coaxial cable bought at the amateur radio buy and sell mart. Velocity factor is needed when cutting that matching stub or phasing those driven elements on that antenna array. The need to measure attenuation arises when that length of coax is getting old and deterioration of its performance is suspected.

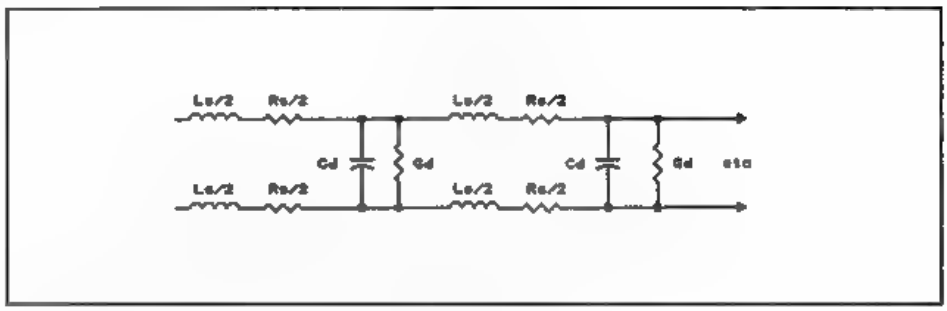


Figure 1 Transmission Line - Electrical line constants

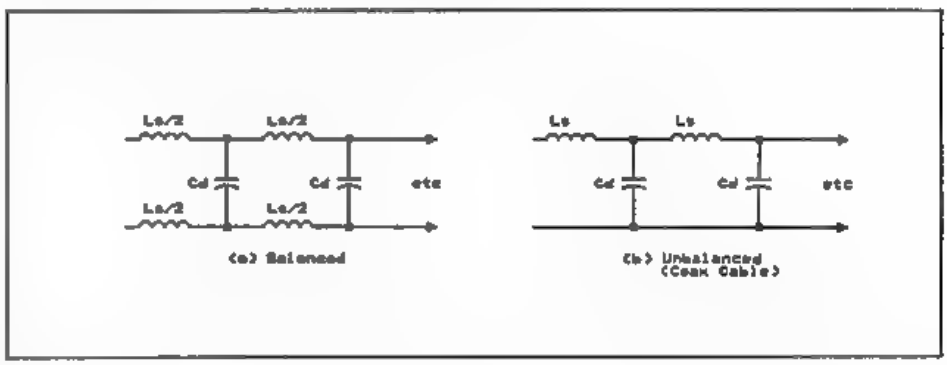


Figure 2 Transmission Line - Electrical constants at high frequencies (Rs & Gd can be ignored)

Characteristic Impedance

Characteristic impedance of a transmission line is the value of impedance presented at its input when it is an infinite length. For a finite length of line, the same impedance is presented at its input if its output is terminated in an impedance equal to the characteristic impedance. When terminated in that impedance, all the energy sent down the line is absorbed by the terminal load and no energy is reflected.

The transmission line can be considered to be made up of four electrical constants:

Ls = series inductance per unit length
Rs = series resistance per unit length
Cd = shunt capacitance per unit length
Gd = shunt conductance per unit length

An electrical representation is shown in figure 1. Constant Rs results from the AC resistance of the conductors. Gd is the reciprocal of the loss resistance in the dielectric between the conductors.

Characteristic impedance (Zo) is calculated from the line constants as follows:

$$Zo = \sqrt{\frac{(Rs + jwLs)}{(Gd + jwCd)}} \qquad \text{(Formula 1)}$$

where $w = 2 \pi \times$ Frequency

The term jwLs is the series inductive reactance per unit length (Xs) and the term jwCd is the reciprocal of the shunt capacitive reactance (or susceptance) per unit length (Bd). At low frequencies, variation in the relative values of these terms to Rs and Gd results in Zo becoming larger as the frequency is decreased.

At high frequencies, jwLs is large compared to Rs and jwCd is large compared to Gd. Hence, at high frequencies, calculation of characteristic impedance is simplified to the following:

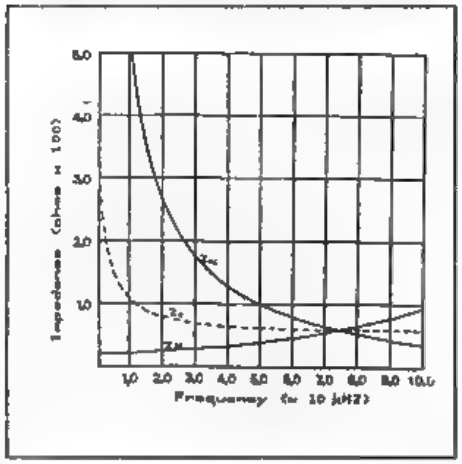


Figure 3 Impedance measurements RG122/U cable 1 kHz to 100 kHz

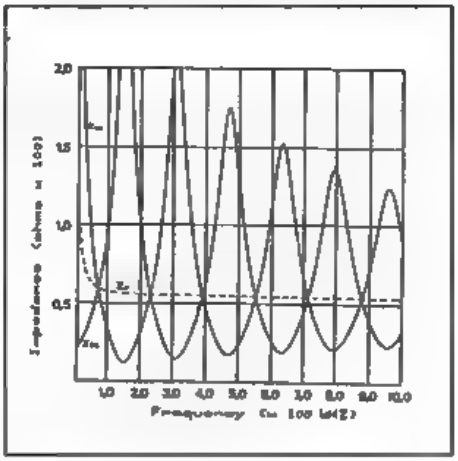


Figure 4 Impedance measurements RG122/U cable 10 kHz to 1 MHz

$$Zo = \sqrt{\frac{(jwLs)}{(jwCd)}} = \sqrt{\frac{(Ls)}{(Cd)}} \quad \text{(Formula 2)}$$

This formula is the one commonly found in radio handbooks. The simplified electrical representation in this form is shown in figure 2. Because the values of inductance (Ls) and capacitance (Cd) are independent of frequency, Zo is constant at high frequencies.

Characteristic impedance of a finite length of line at a given frequency can be derived by taking two impedance measurements, one with the end open circuit and the other with the end short circuited. From these, Zo is calculated as follows:

$$Zo = \sqrt{(Zoc.Zsc)} \quad \text{(Formula 3)}$$

where Zoc = impedance open circuit
Zsc - impedance short circuit

Figure 3 shows open circuit and short circuit impedance measurements carried out on 300 metres of RG122/U 50 ohm coaxial cable over a frequency range of 1 kHz to 100 kHz. The calculated Zo has been added and this illustrates the rise in the value of Zo at low frequencies and the near constant value of Zo, just above 50 ohms, at high frequencies. Figure 4 shows the same cable plotted from 10 kHz to 1 MHz. Observe how the Zo line can be drawn through all the intersection points of Zoc and Zsc. Figure 5 extends the frequency even further with a plot from 100 kHz to 10 MHz. It can be seen that as the frequency is made higher, the excursion of Zoc and Zsc from the value of Zo becomes less, approaching nearer to the condition of an infinite line. The effect would be the same if the frequency were held constant and the length of line gradually increased.

In figure 6, the same type of measurements have been carried out on a one Kilometre length of telecommunications type twisted pair, over a frequency range of 100 Hz to 10 kHz. For this length of line, Zsc can be seen to be fairly constant at low frequencies, defined essentially by the DC resistance of the cable. On the other hand, Zoc rises rapidly as the frequency is decreased and the reactance of Cd rises. The characteristic impedance of this type of cable is nominally around 130 ohms at high frequencies, but in the voice frequency range, its impedance is in the region of 500 to 1000 ohms. This explains why a twisted pair is considered as a 600 ohm circuit in our voice frequency telephone system.

The open circuit and short circuit measurements can be made with a direct reading impedance analyser, or if the instrument gives a result in terms of reactance (X) and resistance (R), impedance (Z) is derived from:

$$Z = \sqrt{(R^2 + X^2)} \quad \text{(Formula 4)}$$

Most impedance measuring devices are unbalanced and difficulties can arise in measuring long balanced lines with these instruments. Figure 7 shows a measurement made on our one kilometre length of twisted pair using an unbalanced instrument and plotting over a frequency range of 10 kHz to 1 MHz. The high frequency impedance stabilises around 130 ohms but there are perturbations shown in the curve. These were caused by interference to the measuring device from unbalanced signal components picked up from local broadcast stations and aircraft homer beacons. The interference can be eliminated by using a coupling transformer between the instrument and the line but the characteristics of the transformer must be taken into account in interpreting the results of the measurement.

A simple method to measure open circuit and short circuit impedance is shown in figure 8. A signal generator is fed via resistance Rs into the line load or substitution resistor Rx, as selected by switch Sw. Rs is made high to simulate a constant current source. Assuming constant current, voltage across the line or resistor load is directly proportional to the impedance of the load. Sw is first selected to connect the cable with its end open circuit. Voltage fed to line is measured using a cathode ray oscilloscope (CRO) or a vacuum tube volt meter (VTVM) coupled through a high impedance probe. The switch is then operated to connect variable resistor Rx which is adjusted to obtain the same voltage. The resistance value of Rx is now equal to the open circuit impedance and if Rx is uncalibrated, its value can be measured using a multimeter or resistance bridge. The procedure is then repeated with the end of the cable short circuited to obtain short circuit impedance.

To achieve good accuracy in measurement, source resistance Rs should be made as high as possible and at least several kilohms. However, if made too high, there

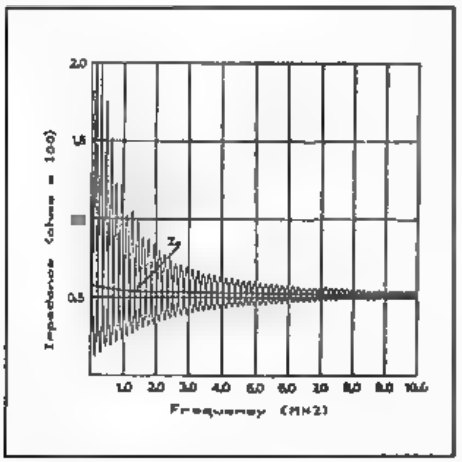


Figure 5 Impedance measurements RG122/U cable 100 kHz to 10 MHz

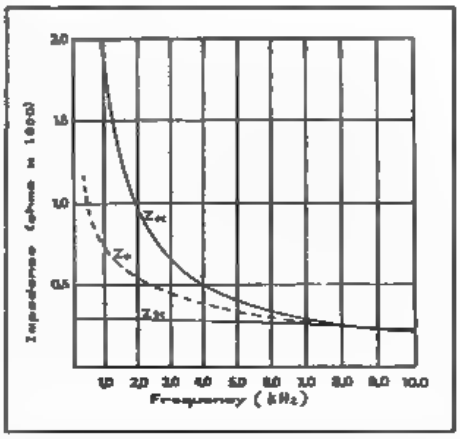


Figure 6 Impedance measurements twisted pair communication cable 500 Hz to 10 kHz

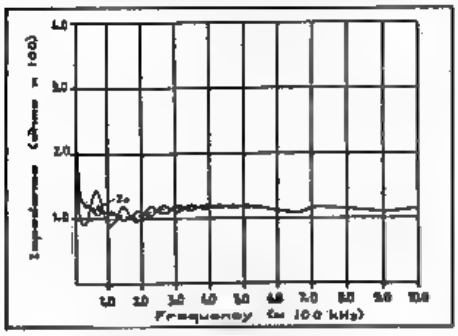
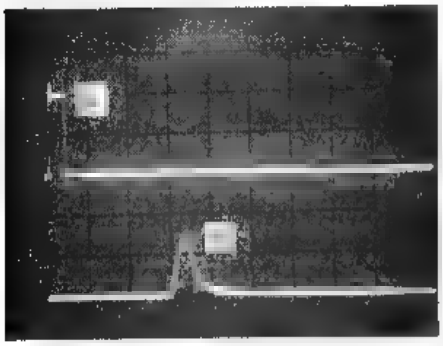
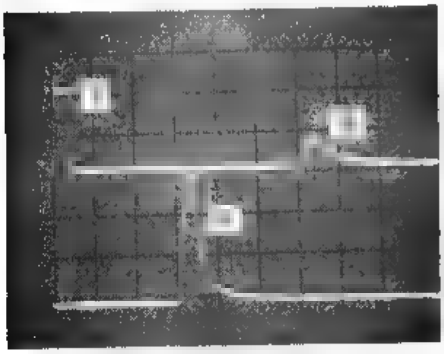


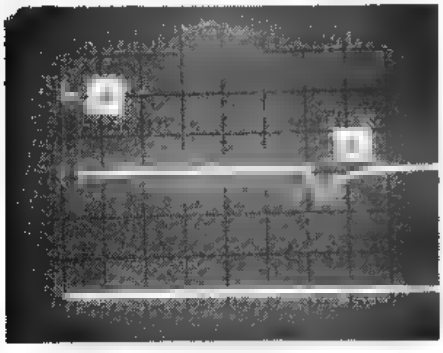
Figure 7 Impedance measurement twisted pair communications cable - 10 kHz to 1 MHz



(a) Cable terminated in 50 ohms



(b) Cable end open circuit



(c) Cable end short circuit

Figure 9 Time domain pulse tests on 300 metres of RG122/U 50 ohm cable. A = incident pulse; B = received pulse; C = pulse reflected back to input. Time scale is 500 nanoseconds/division

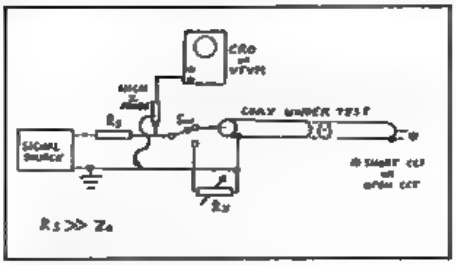


Figure 8 Impedance measurement of cable by substition

could be some difficulty in getting enough voltage for a workable reading on the CRO or VTVM. Using equipment in the writer's radio shack, a value of 2.2 k ohms was as high as could be tolerated for a suitable CRO reading. With this value of Rs, characteristic impedance of three cables, believed to be 50, 75 and 95 ohms respectively, measured 54, 78 and 99 ohms. These measurements were a little high but near enough to identify which cable was which.

In measuring the high frequency characteristic impedance by this substitution method, a precise value of measurement frequency is not important. However, a frequency as low as 1 or 2 MHz is suggested so that the capacitance and inductance of the high impedance probe and connecting earth lead, have little effect on the measurement accuracy.

Use of the Line Constants

Another method of determining characteristic impedance is to measure the line constants and calculate impedance from these. To measure the constants, a length of cable must be cut no greater than one eighth of a wavelength at the frequency of measurement or, if the cable length is fixed, the frequency of measurement must be lowered until this criterion is achieved. With the cable end short circuited, values of series inductance (Ls) and series resistance (Rs) are measured. With the cable end open circuit, values of shunt capacitance (Cd) and shunt conductance (Gd) are measured. In practical cables, shunt resistance is high and Gd can generally be ignored and considered as equal to zero. Using the values measured, the characteristic impedance can be calculated either from formula (1) or, for high frequencies, from formula (2). There is one factor to be considered when making use of the series resistance constant (Rs). Due to skin effect, the series resistance increases with frequency and hence the value of Rs can only be considered valid if measured near the frequency at which the impedance calculation is made. At high frequencies, formula (2) is used and variation in the value of Rs is of no consequence.

As a practical example, the 300 metre length of RG122/U was measured using this method. To satisfy the less than one eighth wavelength criterion, the constants were measured at 20 kHz. Results were as follows:

Short circuit	Ls = 87.8 microhenries (Xs = 11.3 Ohms) Rs = 21.5 Ohms
Open circuit	Cd = 29.53 nanofarad (Bd = 3.7 millimhos) Gd = 0 097 millimhos

At high frequencies, the square root of Ls/Cd calculates to 54.5 ohms and close to that derived in the curve of figure 4. At the measuring frequency of 20 kHz, the complex quantities calculate to give Zo = 80.7 ohms. For those unfamiliar with complex numbers and "j" notation, where you see a term such as "R + jX" simply calculate impedance (or admittance) using the square root of the sum of the squares, as in Formula 4.

Any instrument which can separately measure resistive and reactive components can be used to measure the line constants. A Q meter can be used but measurement must be carried out at frequencies in the megahertz region with a much shorter length of cable than that of the previous example. If the cable length were reduced by an order of 300 to 1 metre, the line constants could be expected to be changed by the same order and Ls would equal 0.3 microhenry and Cd would equal 98 picofarad. The Q meter could comfortably handle these values. Increasing frequency by the same order would give a suitable measuring frequency of 6 MHz.

The line constants can also be used to calculate other characteristics of the cable such as attenuation, phase velocity and dielectric constant. Attenuation is frequency dependent because of the variation in series resistance (Rs) and shunt conductance (Cd), both of which increase in value as the frequency is increased. Phase velocity and dielectric constant are only dependent on inductance (Ls) and capacitance (Cd) and hence their values are constant, independent of frequency. More detail on how to calculate the value of these characteristics from the line constants is given in the appendix at the end of the article.

Time Domain Reflectometry

One way to determine the time taken for a signal to pass down a length of transmission line is to feed, into the line, short duration pulses separated in time by a value greater than the expected transmission time. The time taken for a pulse to get to the end of the line, or to be returned after

reflection, is measured using the calibrated time base and graticule of a cathode ray oscilloscope (CRO).

Figure 9 is a record of some tests carried out on the 300 metres of RG122/U ohm cable to determine transmission time over its length and hence its velocity factor. In figure 9 (a), the 250 nanosecond pulse A on the top trace is fed down the cable which is terminated in 50 ohms at the other end. Pulse B on the second trace is the signal received at the terminated end and displaced in time by 1.5 microseconds. The transmission time for 300 metres of cable is therefore 1.5 microseconds.

In figure 9 (b), the termination is removed so that the end is open circuit. The signal is now reflected back to the input and is shown as pulse C displaced 3 microseconds from the initiating pulse A. The pulse amplitude of B at the open end has noticeably increased in level but there is no need to consider this pulse at all as it is only necessary to halve the time between C and A to obtain the cable transmission time.

In figure 9 (c), a short circuit is placed across the cable end. Again, the pulse is reflected back to the input 3 microseconds later. It can be seen that the reflected pulse C is now inverted and this is because a reflection from a short circuit, or a lower resistance than Zo, produces a phase reversal. If "t" is the time recorded between pulses C and A and "S" is the length of the cable, velocity factor (V), or the ratio of phase velocity in the cable to that in space, is calculated as follows:

$$V = S/(150t)$$
$$= 300/(150 \times 3) = 0.67$$

In figure 10, we set out on a different tack to measure the unknown length of a roll of RG58 cable which we know has a velocity factor of 0.66. In this case, we have used a pulse width of 200 nanoseconds and the time measured between incident pulse (A) and reflected pulse (B) is recorded as 0.65 microsecond. The length (S) is calculated as follows:

$$S = 150tV$$
$$= 150 \times 0.65 \times 0.66 = 64.4 \text{ metres}$$

The time domain measuring technique can also be used to locate faults in a transmission line. Any discontinuity in the impedance of a line will cause a reflection of signal. If the line develops a fault part way down the line, the location of the fault can be easily worked out in terms of distance to the fault by measuring time between the incident pulse and the pulse returned from the fault. The phase of the returned pulse also gives a lead to whether the fault might be an open circuit or a short circuit

Time domain tests, such as those discussed, can easily be carried out using a simple pulse generator and a CRO with calibrated time base. The pulse duration is not critical but should be small compared to the transmission time measured. The higher the pulse repetition frequency, the easier it is to get a satisfactory CRO trace, but the time between pulses must be greater than twice the transmission time taken by a signal to pass down the line. In the tests recorded in figures 9 and 10, pulse spacing used was 5 microseconds.

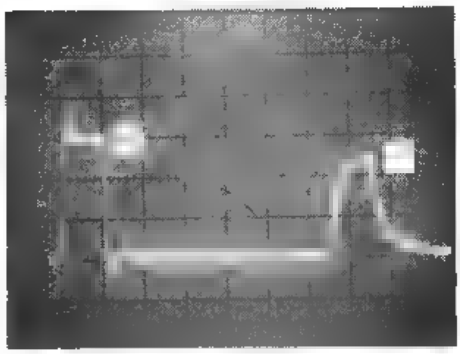
As can be seen in figures 9 and 10, transmission within the cable degrades the rise time of the reflected pulse and to maintain accuracy of measurement, time should be measured between the leading edges of the initiating and reflected pulses.

The reflected pulse can be further used to determine characteristic impedance. The procedure is simply to substitute different values of terminating resistance until a value is found which returns no reflected signal. This value is equal to Zo. The direction to increment or decrement the resistance value is indicated by whether the pulse is inverted or otherwise. A wide initiating pulse is recommended for this purpose as this gives a higher level of reflected pulse making it easier to obtain fine resolution of the precise resistance. Of course, the same substitution method of measuring Zo can be applied using a transmitter to feed a carrier into the line via an SWR meter to indicate lowest reflected power. In this case, one must be careful to minimise transmitter power to prevent burning out the substitution resistors.

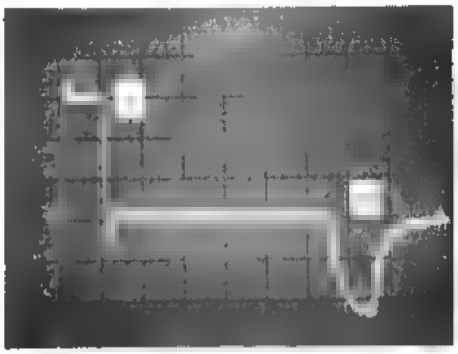
A Simple Pulse Generator

A simple pulse generator for time domain measurements can easily be made using readily available integrated circuit packages. An example of such a generator, experimented with by the writer, is shown in figure 11. This is based on an idea found in one of the ETI circuit books and submitted to ETI by Philip Dennis. The pulse is generated by a monostable multivibrator N1 with pulse width controlled by the values of C2, R3 and RV1. The circuit is arranged to re-trigger itself at a pulse repetition time set by the values of C1, R2 and RV2. Using the circuit values shown, pulse width is adjustable between 50 and 500 nanoseconds and pulse repetition time is adjustable between 0.5 and 10 microseconds. A non locking start switch or button SW1 was found to be a necessary inclusion in the circuit as the pulse train did not always start itself on power up. Emitter Follower V1 provides a low source resistance to feed the test cable.

The Q bar negative going pulse output is used as this gives a better shaped output waveform than the positive going output



(a) Cable end open circuit



(b) Cable end short circuit (Note phase reversal of reflected pulse)
Figure 10 Time domain pulse tests on an unknown length of RG58 cable. A = incident pulse; B = reflected pulse. Time scale is 100 nanoseconds/division and length is calculated from velocity factor of 0.66 to be 64 metres.

which is loaded by the pulse repetition timing circuit. For the purposes of the transmission line tests, it does not matter whether the pulse is positive going or negative going but if desired, the whole circuit could be inverted by reversing the connections on the input AND gate, reversing the diode and reversing the Q and Q bar connections. Another alternative would be to add an inverter gate between the Q bar output and the follower stage.

Measurement Using Current Nodes

If the end of a transmission line is short circuited, a current node occurs at a half wavelength (and any subsequent half wavelengths) from the shorted end. This can be used to measure the velocity factor of a line or cable as shown in figure 12. For this test, a signal generator is fed via a resistor to one end of the cable and the other end is a short circuit. A high impedance probe from a VTVM or a CRO is

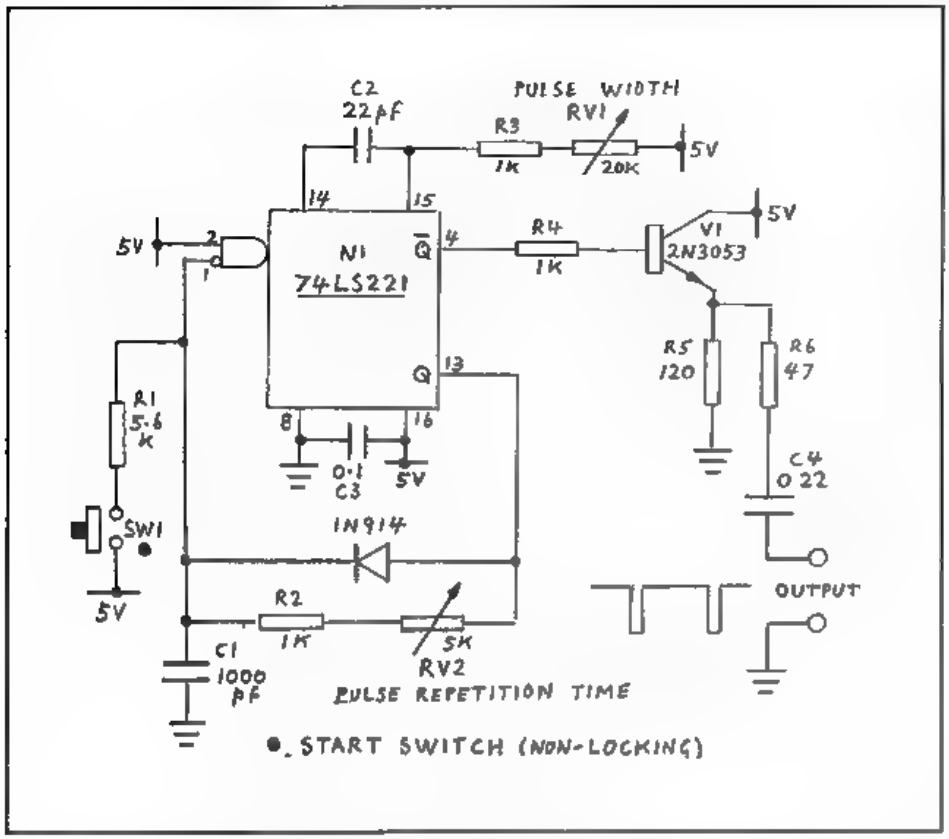


Figure 11 Simple pulse generator for time domain measurements

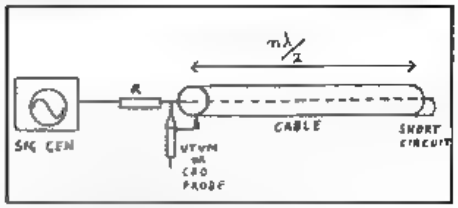


Figure 12 Measurement of velocity factor using current nodes

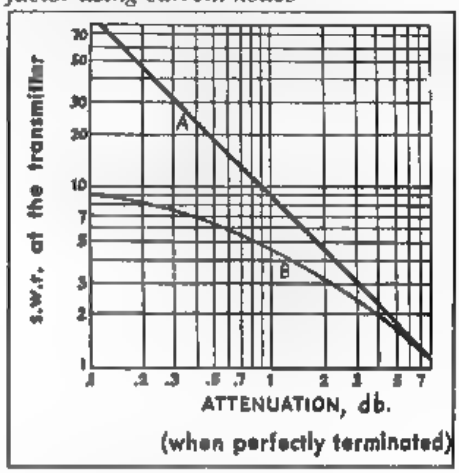


Figure 13 SWR at the transmitter VS matched line attenuation Curve A - short circuit at end of cable
Curve B - end of cable loaded to give SWR = 10

connected right at the signal source end. The frequency of the signal generator is adjusted for a dip in voltage reading on the VTVM or CRO indicating a current node. Using this frequency in the calculation, velocity factor is derived as follows:

$$\text{Velocity factor (V)} = \frac{Sf}{150n}$$

Where S = length of cable in metres
f = frequency (MHz)
n = number of half wavelengths
("n" is any integer which gives a value of V between 0.5 and 1.)

Attenuation

Attenuation of a transmission line can be measured by a number of methods. If the line is correctly terminated in a resistance equal to its characteristic impedance, a signal can be sent down the line and the voltage across its termination can be compared with the voltage fed into the cable. The signal source can be a signal generator or a transmitter and the voltage can be monitored on a VTVM or a CRO via a high impedance probe. Attenuation in dB is equal to 20 times the logarithm of the voltage ratio. Test probes normally have a capacitance of 10 pF and this capacitance, together with the inductance of the probe tip and earthing conductor, will upset the matching at VHF frequencies. Hence, this method of measurement is not recommended above 25 MHz.

Most radio amateurs have a coaxial line swr/power meter and this can be used to compare power at each end of the cable. The cable is again terminated in a resistance equal to its characteristic impedance, the usual dummy load. The meter is first inserted at the transmitter end and the transmitter power, or the meter adjustment, is set for a full scale reading of power (say 10 on the meter scale). Being careful not to alter the transmitter and meter adjustments, transfer the meter to the load end and read off relative power. For example, if the scale reads 7, the power ratio is 7/10 = 0.7 and the cable attenuation is 10 times the logarithm of this value. Attenuation per unit length is calculated by multiplying the measured attenuation by the ratio of unit length to length measured.

A method of checking the attenuation of coaxial cable, using a SWR meter at one end, has been described in some issues of the ARRL antenna handbook, and was also described in Novice Notes, AR December 1978. In this method, a short circuit is connected at the load end of the cable and SWR is measured at the transmitter or source end. The greater the attenuation, the lower the level of reflected signal and hence the lower the SWR reading. The decibel ratio of power returned to forward power, is a measure of cable attenuation times two, however the attenuation is greater than it would be if the cable were correctly matched. With the high SWR, higher current at current antinodes causes greater dielectric loss. Hence, a correction has to be made to derive expected attenuation when the cable is correctly matched. For further reading, Ron Cook VK3AFW has discussed this effect in Novice Notes, AR November 1981.

Curve A of figure 13, taken from the ARRL antenna handbook, shows the relationship between SWR at the transmitter and corrected attenuation for a cable when properly matched. This can be used to derive attenuation using the method described above with the cable end short circuited. However, there are problems in the practical application of curve A. First of all, most SWR meters are only calibrated up to an SWR of 3 and even if they were calibrated higher, the upper scale graduation would somewhat compressed. Using curve A, this somewhat limits attenuation measurements to 3 dB and above.

To obtain higher SWR measurements, the ratio of reflected power to forward power can be directly measured. If your SWR meter does not have means to separately

measure reflected power, what you can do is reverse the input and output connections to the meter and what is read as forward power will actually be reversed power. SWR is then calculated from the following:

$$SWR = \frac{1 + \sqrt{K}}{1 - \sqrt{K}}$$

Where K is the ratio of reflected power to forward power.

A further suggestion is offered by the writer to resolve lower values of attenuation. To achieve this, we create a lower finite value of SWR at the load end of the cable. Curve B of figure 13 attenuation when the SWR at the load is lowered to 10. This SWR can be achieved by terminating the cable in a resistance equal to one tenth of Zo. For example, use a 5 ohm termination for a 50 ohm cable. If the transmitter power is kept low, a number of carbon resistors in parallel can provide the termination. Applying curve B, low values of attenuation can be derived from lower and more readable, values of SWR than those obtainable using a short circuited cable.

Test Equipment

The extent to which the measurements discussed can be carried out in the radio shack depends on what test equipment is available. Some measurements can be carried out with the usual shack equipment of an SWR/Power meter. Time domain reflectometry requires the use of a CRO

Appendix

Calculation of Transmission Line Constants

In the following expressions, the quantity S is the physical length of the line in metres. The characteristic impedance of the line is given by

$$Z_o = \sqrt{\frac{R_s + j\omega L_s}{G_d + j\omega C_d}} \approx \sqrt{\frac{L_s}{C_d}} \quad \ldots\ldots\ldots$$

The attenuation of the line is given by

$$A = \frac{1}{2S} \cdot \frac{G_d Z_o + \frac{R_s}{Z_o}}{1 + \omega^2 L_s C_d} \text{ nepers/metre} \quad \ldots\ldots\ldots$$

$$\approx \frac{1}{2S}\left\{G_d Z_o + \frac{R_s}{Z_o}\right\} \text{ nepers/metre when } S < \lambda/60$$

$$= \frac{4{\cdot}34}{S}\left\{G_d Z_o + \frac{R_s}{Z_o}\right\} \text{ dB/metre}$$

The phase velocity of the line is given by

$$v = \frac{\omega S}{\tan^{-1}\ \omega\sqrt{L_s C_d}} \text{ metres/second} \quad \ldots\ldots\ldots$$

$$\approx \frac{S}{\sqrt{L_s C_d}} \text{ metres/second when } S < \lambda/30$$

The dielectric constant of the line is given by

$$k = \left\{\frac{0{\cdot}31 L_s}{Z_o S}\right\}^2 \quad \ldots\ldots\ldots$$

with calibrated time base and the use of a suitable pulse generator. If the CRO is uncalibrated, the time scale can be referenced against the signal waveform of a calibrated signal generator. If the generator is not accurately calibrated, this can be further referenced to a frequency counter, a Bendix type frequency meter, or a crystal marker generator. A pulse generator is hardly likely to be found in the shack but, as shown in figure 10, a simple one can easily be constructed.

Summary

A range of ideas have been presented on techniques which can be applied to the measurement of transmission lines. If suitable test equipment is available, an interesting day can be spent trying out some of these ideas and finding out all one can about those coax lines or other cables installed or stored away in the shack.

To finalise discussion, we repeat some of the salient points which have been presented:

The transmission line can be represented by four electrical line constants which, if measured, can be used to calculate characteristic impedance, attenuation, velocity factor and other characteristics.

Characteristic impedance is constant at high frequencies but rises inversely with frequency at very low frequencies.

Characteristic impedance can be derived by measuring separately the short circuit impedance and the open circuit impedance and calculating the square root of the product of these two measurements.

A pulse generator and calibrated CRO can be used to measure time between an incident pulse fed down the line and the reflected pulse returned from its end to derive either velocity factor or cable length when only one of these is known. The system can also be used to find the precise location of a cable fault and derive characteristic impedance using a load resistance substitution process.

Attenuation of a correctly matched line can be measured by direct comparison of voltage or power between the output and input of the line. It can also be derived by measuring SWR at the input of the line when the output is short circuited or terminated to give a known SWR at the load.

ar

Have you advised DoTC of your new address?

Weather Satellites (Cont'd)

Paul Hayden
VK4ZBV
38 Lutzow St
Ekibin 4121

Automatic Picture Transmission (APT)

Video format: the visible light sensor on weather satellites converts the light reflected from the earth, sea, and clouds, into an electrical signal. The more reflected light, the larger the video (picture) signal voltage resulting.

The infrared sensor is sensitive to the temperature of the scanned objects. This can vary from land at +50 deg C, to cloud tops in the tropics at -70 deg C. The lower the temperature (high altitude clouds), the higher the video output.

The mirror of the scanning radiometer rotates at 120, 240 or 360 rpm. Each scanned line covers about 1000 kms either side of the satellite's ground track. As the satellite is moving quite rapidly through space, the width of the scanned line is about 2 kms on the ground.

The video output of the scanning radiometer, and the picture sync signal are used to amplitude modulate an audio subcarrier of 2,400 Hz. This is the distinctive tone we hear from our receiver. Clouds produce large subcarrier amplitudes, black objects (no reflected light) produce a minimum subcarrier (not zero).

Due to the variations in picture information along each line, and the rate of rotation of the scanner, the signal produced has a bandwidth of about 1,600 Hz. When modulated onto the 2,400 Hz the result extends from 800 Hz to 4,000 Hz. It is able to be recorded on a good quality stereo tape recorder. (The second track records a 2,400 Hz reference clock track for picture sync on future replay.)

The scanner in the NOAA series is driven by a quartz crystal clock which also provides the audio subcarrier of 2,400 Hz. This allows the receiving station to synchronize its detection and display circuits to those of the satellite.

The METEOR satellites may not have the subcarrier locked to the scanning drive, this complicates the detection and display circuitry slightly.

When the receiving station has an accurate source of 2,400 Hz (xtal clock) available to record on the second track of the tape, the system can then be synchronized to the local clock instead.

The first advantage of this is that when a satellite first comes over the horizon, or is about to disappear below the horizon, or fades in signal strength due to Faraday rotation in the ionosphere, the poor signal to noise ratio of the received subcarrier can cause loss of synch and tearing of the received picture if the incoming subcarrier is used for sync.

With a local clock sync the only requirement is to slide the picture sideways to line it up on the display device. Loss of incoming signal will not cause tearing or loss of sync.

When the display device is synchronized to a clock recorded along with the satellite picture signal, it can track out any speed variations in the tape recorder (wow and flutter), so they have no effect on the reproduced picture.

A xtal clock is necessary to display a stable picture if the subcarrier is not locked to the scanner rotation (some METEOR). The output from a scanning reflectometer has only line sync, the lines are transmitted continuously in real time. The picture starts on AOS (acquisition of signal) and ends at LOS (loss of signal).

The METEOR 2 series satellites run 120 rpm APT with a single visible light picture. This gives a better image resolution (detail) than the NOAA series which compress two images into the same time / bandwidth format.

The line phasing or sync signal between each line of picture is used to identify the satellite and scan/sensor combination in the METEOR satellite series. METEOR 2-16 has 14 white bars on a black background, and MET 2-17 has 16. METEOR 3-2 has 15 white on vis light and 9 black on ir pix.

The NOAA satellites identify each line of pix with tones as the line sync or phasing signal, 1040 Hz vis / 832 Hz ir, (only 7 cycles of each tone per line) Both NOAA and METEOR also transmit step grey scales and telemetry signals including one minute markers beside the line sync pulses

The NOAA satellites derive their low resolution APT pictures from the high resolution pictures produced by the 360 rpm AVHRR (advanced very high resolution radiometer) by transmitting only every third line of the picture.

To be continued

ar

Resistor Selector Program

Bruce Bathols VK3UV
6 Ann Court
Aspendale 3195

A computer program is described to produce a resistance to within a specified tolerance, using combinations of the standard E12 values.

It is not a new program, and was originally published in the Microbee Users Group Monthly magazine "The Catcher", January 1989. I have adapted it for use of IBM XT/ZT and Compatibles, and it will run under GWBASIC. With some modifications, it will be able to be run on most other computers, eg: Apple, Commodore, Microbee, Tandy. It is most useful if you are building a project, and have a junk box full of resistors, and want to find all of the possible combinations available, without having to get out the old faithful calculator.

You can also use the computer to prove to the XYL that your investment in computers can be justified, as it will do other things as well as playing games.

The program is too long to publish here in full, but if you have an IBM XT/AT or Compatible, then I can supply a compiled version (under Microsoft Quick Basic 4.0) which will run direct from MSDOS, together with the source code for GWBASIC.

Send me a cheque for the princely sum of $10 to cover disk, mailing container, and postage, and I will send you the disk by Airmail within a few days. Kindly specify disk type - 13cm (5.25") 360K, or 9cm (3.5") 720K.

Sample Screen Dumps

This program finds possible combinations of resistors of the E12 series that will produce a resistance to within a specified tolerance.

Have you advised the WIA Executive Office of your new callsign? Use the form on the reverse of the AR address flysheet.

Required Resistance (OHMS) = 5000
Maximum Tolerance Allowed (%) = 5
Acceptable range for 5.00 KILOHMS at 5% Tolerance:

Minimum = 4.75 KILOHMS
Maximum = 5.25 KILOHMS

Using One Resistor:

(None within 5% Tolerance)
Using Two Resistors in Series:

2.20 KILOHMS + 2.70 KILOHMS	=	4.90 KILOHMS	(-2.00% ERROR)
1.50 KILOHMS + 3.30 KILOHMS	=	4.80 KILOHMS	(-4.00% ERROR)

Press <ENTER> to continue screen display.

Required Resistance in OHMS = 5000

Maximum % Tolerance = 5
Using Two Resistors in Series:

1.80 KILOHMS + 3.30 KILOHMS	=	5.10 KILOHMS	(2.00% ERROR)
1.00 KILOHM + 3.90 KILOHMS	=	4.90 KILOHMS	(-2.00% ERROR)
1.20 KILOHMS + 3.90 KILOHMS	=	5.10 KILOHMS	(2.00% ERROR)
56.00 OHMS + 4.70 KILOHMS	=	4.76 KILOHMS	(-4.86% ERROR)
68.00 OHMS + 4.70 KILOHMS	=	4.77 KILOHMS	(-4.64% ERROR)
82.00 OHMS + 4.70 KILOHMS	=	4.78 KILOHMS	(-4.36% ERROR)
100.00 OHMS + 4.70 KILOHMS	=	4.80 KILOHMS	(-4.00% ERROR)
120.00 OHMS + 4.70 KILOHMS	=	4.82 KILOHMS	(-3.60% ERROR)
150.00 OHMS + 4.70 KILOHMS	=	4.85 KILOHMS	(-3.00% ERROR)
180.00 OHMS + 4.70 KILOHMS	=	4.88 KILOHMS	(-2.40% ERROR)
220.00 OHMS + 4.70 KILOHMS	=	4.92 KILOHMS	(-1.60% ERROR)
270.00 OHMS + 4.70 KILOHMS	=	4.97 KILOHMS	(-.060% ERROR)
330.00 OHMS + 4.70 KILOHMS	=	5.03 KILOHMS	(0.60% ERROR)
390.00 OHMS + 4.70 KILOHMS	=	5.09 KILOHMS	(1.80% ERROR)
470.00 OHMS + 4.70 KILOHMS	=	5.17 KILOHMS	(3.40% ERROR)

Press <ENTER> to continue screen display.

Required Resistance in OHMS = 5000

Maximum % Tolerance is 5
Using Two Resistors in Series:
Using Two Resistors in Parallel:

5.60 KILOHMS // 33.00 KILOHMS	=	4.79 KILOHMS	(-4.25% ERROR)
5.60 KILOHMS // 39.00 KILOHMS	=	4.90 KILOHMS	(-2.06% ERROR)
5.60 KILOHMS // 47.00 KILOHMS	=	5.00 KILOHMS	(0.08% ERROR)
5.60 KILOHMS // 56.00 KILOHMS	=	5.09 KILOHMS	(1.82% ERROR)
5.60 KILOHMS // 68.00 KILOHMS	=	5.17 KILOHMS	(3.48% ERROR)
5.60 KILOHMS // 82.00 KILOHMS	=	5.24 KILOHMS	(4.84% ERROR)
6.80 KILOHMS // 18.00 KILOHMS	=	4.94 KILOHMS	(-1.29% ERROR)
6.80 KILOHMS // 22.00 KILOHMS	=	5.19 KILOHMS	(3.89% ERROR)
8.20 KILOHMS // 12.00 KILOHMS	=	4.87 KILOHMS	(-2.57 ERROR)
10.00 KILOHMS // 10.00 KILOHMS	=	5.00 KILOHMS	(-0 00 ERROR)

DISPLAY NOW COMPLETED - PRESS <ENTER> TO FINISH?

(A statistician might disagree with the claimed percentage errors, as the tolerance of the E12 ingredient resistors is ten percent - Ed.) ar

How to Use a Dummy Load (or 10 of them)

The common dummy load known to amateurs is a very useful tool in our hobby of amateur radio.

Every amateur should have a dummy load. I have a total of 10 dummy loads: three being home brew and seven purchased over the years. One even has a fan operated from 12 volts built in to keep it cool! I use one dummy load on the respective socket on each of my two antenna tuners in the shack, another in my car, one in my portable tool kit, and one very leaky dummy load I have used to work DX, along with a few spares! The perfect dummy load should be 50 Ohms, purely resistive. All dummy loads are not perfect, however. I have measured a commercial job made in the USA at 42 Ohms. If the wire leads on resistors on home brew dummy loads are too long, the added inductance will alter the impedance at VHF and UHF so keep the leads short.

Below you will find some uses for our friend the dummy load:

1. Check the output of your rig into a dummy load through an accurate power meter. Do not rely upon readings obtained into an antenna.
2. If the rig appears to have a fault on transmit, check it into a dummy load. The fault may be the antenna, feedline or connectors.
3. Check the input SWR of your external power amplifier with a dummy load on the output and an SWR meter before the PA. You may find it is not 50 Ohms input.
4. Check the accuracy of your SWR meter at VHF into a dummy load. If not designed for VHF, the meter may be unreliable.
5. The accuracy of a power meter can be checked against a known accurate meter, into a dummy load.
6. Some low pass filters have an unacceptable input SWR - check into a dummy load.
7. To measure the power loss in a piece of coax, use a power meter and dummy load at the end of the coax, then move it to the input of the coax and note the difference. You may be surprised, especially at VHF and UHF
8. Tune a valve final rig into a dummy load

And on a lighter note . . .

Work QRP DX on an exposed or very leaky dummy load! I have used home brew, open construction purely resistive dummy load in the shack, with 50 metres of wire clipped to the load at a position where maximum leakage occurs. Last night a JA gave me a 469 report on 40 metre CW using the dummy load and 50 metres of wire. I estimate the radiated power to have been approximately 1 watt. The JA was 559. I have measured 1 watt power through a power meter attached to a dummy load via a short piece of coax, it does vary on different positions on the load. (100 watts input).

You could install an exposed or leaky dummy load at the top of your tower, attach a length of wire down to the back fence and work the world! The rig sees 50 Ohms, the feedline sees the 50 Ohm load and the wire radiates whatever it can! I recently received a USA station at readability 5 on a dummy load on the floor of the shack. He was 59+30dB on my antenna designed for 40 metres, though!

By the way, I collect unusual dummy loads, so if you have one I may be interested in, let me know. If you don't have one, get one and start experimenting, as we amateurs are supposed to do, and good luck!

ar

WIA NEWS *continued from page 18*

ate receiving reports of any interference to amateurs in the 50 MHz band from this experimental atmospheric sounding radar in Darwin.

WIA 80 Logo Competition Winner

As all members know, the WIA, the world's first and oldest national radio society, is celebrating its 80th Anniversary during 1990. An important part of this anniversary is the selection of a distinctive logo which will feature on the WIA 80 Award certificates (incidentally, rules for this Award appeared on page 4 of September 1989 issue of Amateur Radio, and eligible contacts for this Award start as from 1st November 1989), the cover of the 1990 WIA 80th Anniversary Australian Radio Amateur Call Book, Amateur Radio magazine, QSL cards, etc., etc..

On page 6 of August 1989 edition of Amateur Radio magazine, we published details of a competition for a design for the WIA 80 logo.

The closing date for entries was the 14th August, but entries kept arriving in the Executive Office until well after that date The judging panel had a difficult task indeed in selecting a winner for the competition.

Eventually J A Wyatt, VK4ZDJ, who submitted two entries of high standard, was judged as the winner. Even though the official WIA 80 logo, which will become very familiar to members over the next 15 months, is different from the winning entry submitted by VK4ZDJ, most of the design points come from his entry.

Although no prize was announced for the winner of the logo competition, we have sent VK4ZDJ a cheque for an amount equivalent to his current membership subscription fee as a small thank you for his contribution to WIA 80.

WIA 80th Anniversary Australian Radio Amateur Call Book

The WIA 1990 Australian Radio Amateur Call Book is now on sale, bigger and better than before. In addition to containing listings for a total of 18,064 current

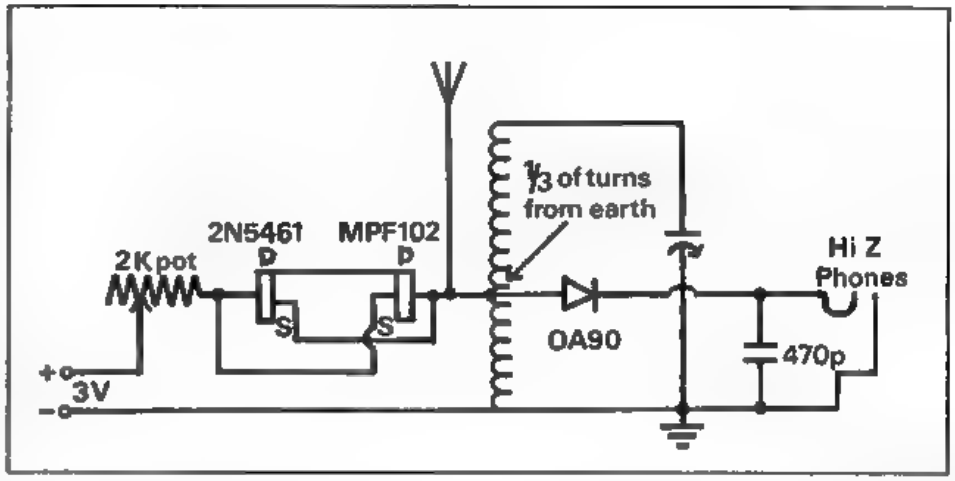
Continued page 31

'Lambda Diode' Regenerative Receiver

Larry Osborn VK3ZSZ
Stoneycroft
Nar Nar Goon 3812

In April 1989 Amateur Radio, in the article on page 14 about the crystal set built by Don Law, I note that Don had an accident with his soldering iron (it happens to all of us at some time) and ruined his tunnel diode. Several years ago, I read an article in a magazine on the "Lambda Diode" which consists of a P channel FET and a N channel FET with the drains connected together, but to nothing else; their sources and gates are cross connected - that is, the gate of one to the source of the other. Positive is applied to the source of the N channel FET, the source of the P channel going to negative. With a MPF102 and a 2N5461 placed across a tuned circuit with the supply varied between 1.5 and 3 Volts, oscillation was obtained up to 60 MHz. Current was approximately 1.0 mA, decreasing with increased voltage.

I connected a MPF102 and a 2N4360 to a very simple crystal circuit shown below. I found that a 2k pot in series with the diode



controlled regeneration, and gave an increase in sensitivity of over 40 dB at 1.6 MHz using a series resistance of 350 Ohms; a current of 2 mA was drawn from a 3 Volt supply. As you will see from the circuit, I made no attempt to optimise the coil tap, doing so would probably have resulted in much better results, I only wanted to prove it would work. I hope this may be of help to someone. ar

MV Doulous. One of the best kept secrets on board the motor vessel, Doulos is Kevin VK7AAS (Home call ZL2BSU) who has similar interests to Manfred VK7AAT (Home call is DL8SBB) his fellow radio operator.

In addition to CW and telephony working, investigations are being made to expand the amateur radio station to include RTTY/Weather Fax/Amtor/Packet Radio/HF Bulletin Board Working.

David Brownsey
VK4AFA

Magazine Review

Roy Hartkopf VK3AOH

(G) General (C) Constructional (P) Practical without detailed constructional information (T) Theoretical (N) Of particular interest to the Novice (X) Computer program

Radio Communication Jan 1989: Simple two metre receiver (C) Peak envelope power sideband indicator (P)

QST Feb 1989: Low cost frequency counter (C) QRP EME on 144 MHz (G) Transistor radios as Ham receivers (C)

QST March 1989: Simple 80 metre converter (C) Power dissipation in parasitic suppressor resistors (T)

QST April 1989: Coaxial resonator match and the broadband dipole (C) Power FET switches as RF amplifiers (C)

QST May 1989: Spread spectrum link (P) Time domain reflectometer (C) Low noise microwave preamplifier (C)

VHF Communications 4/1988: Introduction to moonbounce (G) Hybrid parabolic dish antenna (P). ar

Broadside on 10

Richard Burden VK6FKB
PO Box 1164
Booragoon 6154

Here is a simple two element broadside array for ten meters. It has a bi-directional pattern with a gain of nearly 4dB over a dipole. I found it ideal for communicating in a fixed direction when a compromise antennae with a wide bandwidth was necessary. It can be scaled for use on different frequencies, but I would not want a 160 meter version in my backyard!

This aerial consists of two half-wavelength vertical elements spaced one half-wavelength apart. The two vertical elements are end fed via quarter-wave series matching sections producing a bi-directional pattern due to the two elements being in phase. The theoretical free space gain is 3.8 dB. Note that the series matching section is constructed from open-wire feeder, not 300 ohm ribbon or coax. This ensures that the electrical length of the transmission line between the two elements is one half wavelength.

The main transmission line is connected as shown in Fig 1. By adjusting the spacing S of the matching sections, the impedance of the matching sections can be altered to transform the terminating impedances to the 50 Ohms required at the feedpoint.

I mounted each vertical element on a wooden post with the coax supported at the feed point by another post. I initially set the spacing by screwing to each post one solder lug 40mm below the end of the element, and soldering the bottom wire to each of these lugs. I had already drilled holes ready to accommodate different settings but 40mm gave me a SWR of 1.1 to 1 at the transceiver when I checked it. So I put the tools away and started talking.

ar

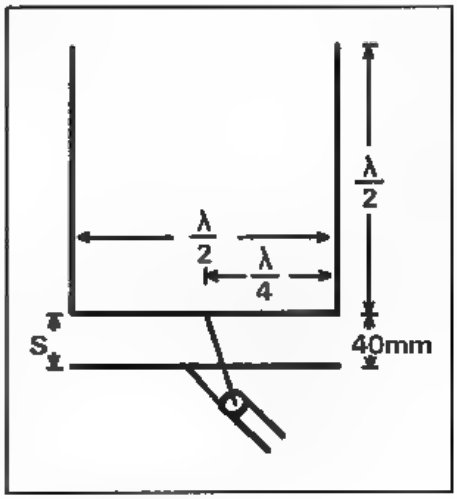


Fig 1 Antenna System

WIA NEWS *continued from page 28*

Australian amateur station licences, and 732 WIA Shortwave Listeners, this Call Book incorporates that reference data most needed for your operating enjoyment.

Included are a listing of all Australian duplex repeaters, from the 29 MHz to the 1296 MHz bands, listed in frequency order within each call area; a map of Australia showing where most repeaters are located; a list of Australian simplex packet repeaters; amateur TV repeaters, Australian beacons on 50 MHz and above; foreign 50 MHz beacons; Australian and foreign 28 MHz beacons; 14 MHz beacons; the current ARRL DXCC countries list, which is the list used for the Australian DXCC and the Australian band plans (including the proposed new 1296 MHz band plan).

We expect this 1990 Call Book to be a big seller. Executive Office stocks of the last Call Book sold out in just 6 weeks, so make sure that you order your copy of the lastest, 1990 Call Book now.

The cover price is the same as last year, $9.90, plus postage and packing if applicable.

However, financial members of the WIA can obtain a copy from their Divisional Bookshop for the discount price of $8.50, plus postage and packing if applicable.

WIA/DoTC Joint Meeting

Although the WIA is in constant communication with DoTC in Canberra by telephone, Fax, and the mail, regular face to face meetings are held between DoTC and WIA personnel. Sometimes these meetings take place in Canberra, but generally the DoTC representatives from the Regulatory Section come to Melbourne.

At the most recent Joint Meeting, many matters of interest and concern to both the WIA and DoTC were discussed in and a full and frank manner.

Just some of the topics discussed included reciprocal licensing with Italy, exemptions for non-qualified amateurs operating in Antarctica, alternate frequencies for ATV, random allocation of VK9 callsigns, the agenda for the 1992 WARC, issuing of callsigns to visitors to Australia, third party traffic bi-lateral agreements, 28 MHz beacons, crossband repeater linking, fees for DoTC investigation of interference complaints, devolvement of amateur examinations, and the 23 cm band plan. Many of these items are ongoing and have been publicised by the WIA on previous occasions.

Something new of interest to amateurs is that DoTC are currently exploring proposals for licence fee payment at Post Offices. At present there is a trial running in Western Australia involving the CBRS licence applications and certain classes of renewals. If the trials are successful, the facility will be expanded to the rest of Australia.

Hopefully, the next step will be to include the amateur service in this convenient method of paying licence renewals.

Mobile Amateur Radio Operation

Have you had the experience of installing your mobile equipment in a new car (assuming you could find space for it in the newer design of motor car!) and finding all sorts of funnies happening to the car electrics when you press the microphone button? Direction indicators, the electronic ignition, on-board computers, etc. behaving strangely? And the dealer not really knowing what you are talking about?

Well, there seems to be some hope that car manufacturers are finally realising this is a problem which will not go away, and needs to be addressed. From the latest ARRL Newsletter comes news that the General Motors Corporation in the USA has just released a brochure entitled "Radio Telephone/Mobile Radio Installation Guidelines".

continued on page 56

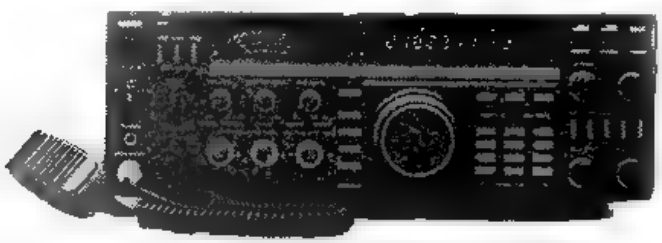
THE GEORGE BUSH, MA
MIKHAIL GORBACHE

What has made Icom's range of transceivers world leaders in their class? Could it be the uncompromising standards of a George Bush? Is it the durability of a Maggie (Iron Lady) Thatcher? Or the innovative thinking of a Mikhail Gorbachev?

It is, in fact, a combination of all three.

Which has led millions of radio users around the world to choose Icom. Their vote has made Icom the world leader of transceivers.

The Icom IC-725 HF mobile 500KHz-30MHz transceiver is complete with DDS synthesiser, 26 memories (two memories for duplex frequencies), switchable pre-amplifier, scanning, CI-V system for PC control, built in antenna tuner controller and band stacking register.

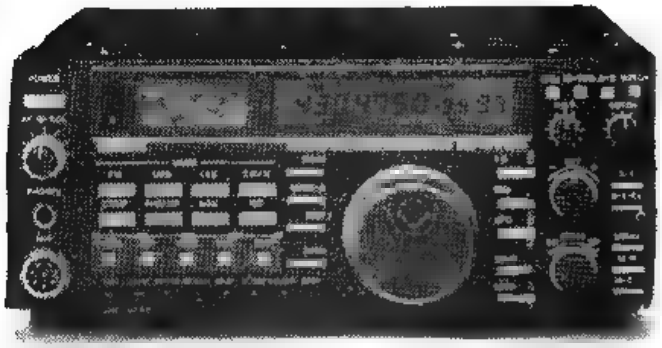


The Icom IC-765 HF transceiver features DDS synthesiser, high speed auto tuner, built-in AC power supply, 99 programmable memories, keyboard frequency entry, band stacking register, general coverage receiver 100KHz-30MHz, CI-V system for PC control and rack mounting dimensions.

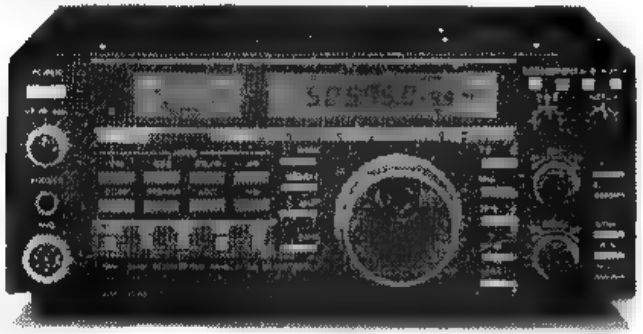
The Icom IC-32AT dual band FM transceiver outputs 5.5W and has a full duplex crossband operation, on/off switchable power saver and 20 double-spaced memory channels that can store two frequencies. The programmed scan function scans all frequencies between two programmable frequencies. And Priority Watch monitors the Call Channel, a memory channel or all the memory channels in succession, every five seconds

The Icom IC-228A (25W) and IC-228H (45W) mobile FM 144MHz transceivers are compact and easy to operate with 20 memory channels, multi-colour LCD programmed and memory scans, variable tuning steps, priority watch, main controls lit for night operation.

RGARET THATCHER AND V OF TRANSCEIVERS.



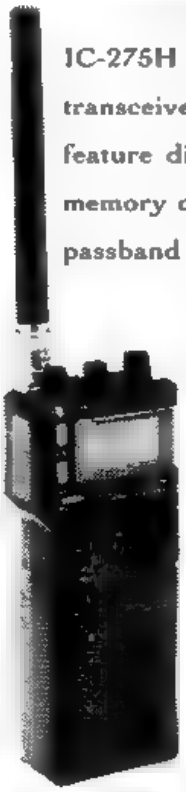
The Icom IC-475A (25W) and IC-475H (75W) 430 MHz All Mode transceivers are designed for packet mode with direct digital synthesizer (DDS), 99 memory channels, USB, LSB, CW, FM, passband tuning and adjustable IF notch filter.



The Icom IC-575A (10W) and IC-575H (100W) 28/50 MHz All Mode transceivers have a receiver coverage of 26-56 MHz and are equipped with direct digital synthesizer (DDS), 99 memory channels, and passband tuning.

The UHF FM Icom IC-4 GAT with 6 watt output has digital touch step for frequency selection, programmable call channel, LCD readout, optional pager function, programmed and memory scans, automatic power save and 20 memory channels.

The Icom IC-275A (25W) and IC-275H (100W) All Mode 144MHz transceivers are designed for packet mode and feature direct digital synthesizer (DDS), 99 memory channels, USB, LSB, CW, FM, and passband tuning.



The palm size Icom-2SA, 144 MHz FM transceiver has 5 watts output with optional BP-85, 48 memory channels and an automatic power saver, LCD readout, operation from battery or external 12V DC supply A PTT lockout switch is provided to prevent accidental transmissions Options include: paging, code squelch functions and beep tone on/off control.

Call Melbourne on (03) 529 7582 or interstate on (008) 338 915 for your nearest Icom stockist. ICOM

CO 004

Dove to Beam Down on Planet Earth

Jim Linton VK3PC

"Au dessus du monde c'est aussi avec la paiz comme il serait sur la terre"

The Digital Orbiting Voice Encoder — DOVE — a microsatellite sponsored by the Brazilian branch of AMSAT, the amateur radio satellite organisation, will be launched soon.

As it orbits the earth, DOVE will transmit digitised voice messages, interspersed with spacecraft engineering data, using narrow band frequency modulation on a frequency of 145.825 MHz. Here's a sample of what you might expect to hear in a typical 10 minutes plus pass:

Voice DOVE ID:	10 seconds
Voice LAP 1 Message:	20 seconds
Voice Telemetry:	1 minute
Packet Bulletin:	30 seconds
Voice LAP 1 Message:	20 seconds
Voice Bulletin:	1 minute

Repeat of above . . . . .

DOVE will provide a creative vehicle for students around the world to express their thoughts about the need for peace on the planet earth. This aspect is called the Language Arts Project 1 or abbreviated as LAP 1. It will include messages in at least 11 languages (with English translations) being transmitted. Tape recorded messages are being encouraged from schools throughout the world for use by DOVE.

An example of a LAP 1 message appears at the top of this article and translated into English, it says: "Above the world it is as peaceful as it could be down here on earth." This message was provided by Michael Shidler, aged 12, of Fort Wayne, Indiana. His message and many others will be uploaded to the microsat computer in a digitised form.

Peace messages must consist of 40 words or less and will be broadcast in groups of up to five on each orbit and changed at least twice a week. Any school intending to supply such recordings should carefully read requirements for the contents of message, to avoid unsuitable topics and matters which could be considered as propaganda. Different uses by school children of DOVE's digitised voice message facility are being considered for later in its life, and particularly during activities of the International Space Year 1992.

The other objective of DOVE is to act as a scientific and technological teaching tool in orbit. DOVE's downlink using four watts of RF will be easily received by a simple receiver, with modest antennas, or by amateur radio equipment tuned to the two metre band. Most schools should be able to receive the signal clearly in the schoolyard or classroom, as the satellite is expected to provide usable orbit passes lasting ten minutes.

It is planned to launch DOVE into a Sun Synchronous orbit at a height above the Earth of approximately 850 km. In this type of orbit the satellite will pass in optimal range of ground stations at any point on earth at approximately the same local standard time twice each day. DOVE should be heard at about 1030 am and 1030 pm plus or minus the time of one orbit - 101 minutes. The satellite will also be heard on other orbits on either side of the optimal pass.

Once DOVE is launched, a teachers' guide will be available to help them take advantage of the unique opportunity to use amateur radio and satellite communications as a teaching tool.

DOVE's transmission can be used in classrooms in a variety of ways. Physics, astronomy, electronics, computer, geography and language studies can all make creative use of the signals being beamed from space. The satellite can be tracked via graphical aids or by a program ready to run on school computers. If required, some assistance can be given to correctly locate the satellite.

If DOVE lives up to expectations, it will provide plenty of opportunities to achieve excellent publicity for our hobby if sufficient radio amateurs, whether they be teachers or parents, act now and get involved. A free information kit is available for those interested in helping DOVE activate a school by writing to:

Project DOVE, WIA Victorian Division, 38 Taylor Street, Ashburton Victoria 3147.

A Special Report from Brazil

DOVE first began in the mind of Dr Junior Torres de Castro, a prominent Brazilian geologist and radio amateur. His strong interest in amateur radio satellites led to his becoming founder and President of BRAMSAT, the Brazilian Radio Amateur Satellite Organization. Having nine children of his own, led him naturally toward the educational uses in schools of satellites. Junior is also Scientific and Technical Director of the Capricorn Observatory near Sao Paulo, a sophisticated astronomical installation with a strong educational mission. His vision of DOVE as a symbol of peace and learning, combined with the financial resources to make it a reality, have brought DOVE into existence. The compact MicroSat design of AMSAT-NA was chosen by Dr de Castro as the basis for DOVE. AMSAT-NA's team, under Chief of Engineering Jan King, is building DOVE and the other birds in the MicroSat "flock" at the AMSAT-NA Lab in Boulder, Colorado.

The frequency is now 145.825 MHz, the same frequency that the two University of Surrey UoSAT satellites use. Both UoSAT OSCAR 9 and 11 are in polar orbits, several hundred kilometres below DOVE's planned orbit. The UoSAT's are veterans in polar orbit and pioneering educational/scientific satellites. UoSAT OSCAR 9's orbit is decaying rapidly due to atmospheric drag and it is quite likely that it will die a fiery death in the atmosphere a few weeks before DOVE's launch date. So, DOVE and UoSAT OSCAR 11 will hold forth on 145.825 MHz.

Inside DOVE

DOVE is divided into five equal 1.5 inch high modules Module 1 contains a special receiver for experimental communications work. Model 2 contains DOVE's computer. Module 3 is DOVE's power module with battery charge regulator (BCR) and Ni-Cad batteries. The batteries are charged by DOVE's highly efficient solar cells, which almost totally cover its outer surface. Module 4 is DOVE's speech digitizer/synthesizer. DOVE's 2 meter transmitter is located on the bottom in Compartment 5 and attached to DOVE's antenna system.

ar

HOW'S DX?

All Bands Busy

Stephen Pall VK2PS
PO Box 93 Dural 2158

In the absence of a permanent DX news editor, here is some information which will keep this column alive and hopefully will be of some help to the DX enthusiasts. Pat VK2RZ has done an excellent job as the editor of this column, and we are all sorry that he had to give up the dissemination of DX News.

CN6Ø Morocco

I worked this interesting prefix on 15 July. The special prefix was in use only for a few days, celebrating the 60th birthday of Hassan II, the King of Morocco. Within a short period I worked CN6ØCV Mohamed, CN6ØAC L'Habid, CN6ØMA Ben, and CN6ØMC the Club station of the Moroccan Amateur Radio Society. Working the club station and six additional Moroccan stations with the special prefix, would have entitled me to receive a special award and an entry into a special lottery among the DX stations, where the first prize is a gold medallion, second prize a silver one, and the third prize bronze. QSL to the Association of Moroccan Amateur Radio Clubs, PO Box 299, RABAT Morocco, Africa.

F89/France

A number of French stations were worked, F89/F6BVB, F89/FK8FG Bernard. The special prefix is used by some of the French amateurs, celebrating the 200th Anniversary of the French Revolution.

3D2 Conway Reef

This was a surprise. It just appeared on the bands. A number of Western German amateurs under the leadership of the well-known DX-er Baldur DJ6SI, landed on the reef on 28 July and was very active on several bands in SSB and CW for a few days. Several call signs were used. Worked 3D2WV Karl on 21 MHz, SSB. QSL to DK2WV, 3D2VT operated in the CW mode on 7 MHz. QSL to, DK2WV

DX-peditions in the Pacific

Bing VK2BCH spent many weeks on Rotuma Island, which is now officially recognized as a "new" DX country. Shortly after Bing left, Roly ZL1BQD, the well known ZL DXer has appeared on the Island under the callsign 3D2RJ. He was assisted by Andrew OZ1XJ who operated under the callsign 3D2AH. QSL for both call signs to ZL1BQD.

However, others also had the urge to operate under a Pacific call sign. 3D2AK Alice on her way back to the Northern hemisphere operated from Apia. QSL to VE7YL. H44/VK3ERD was active on Guadalcanal. QSL to VK3CAX. T32IO Richard on Christmas Island - QSL to AH6IO, T32PO John also on Christmas Island - QSL to NH6PO, 5W1IK Taka in Apia. QSL to JA3RCT, A35SA Arch in Tonga. QSL to KB7QC. 5W1IF Ved in Apia - QSL to JA3RCT, KH8/P/JA4RED in American Samoa - QSL to home call. KA3HMS/KH3 Bill on Johnston Island - QSL to KA3HMS. 5W1IE Kio in Apia - QSL to JA3RCT.

And here is the list of some other interesting DX QSOs.

YJ8RG	Ron is active again in Vanuatu. 21 MHz, SSB - QSL to VK4BRG.
CO4/CM2ED	This was a 24 hours DX-pedition on the Isle of Pines - QSL to CO4RCB. It is interesting to note that the number of active CO/CM stations has increased in the past few months.
FR4FD	Pat on Reunion Island, 21 MHz, SSB - QSL to F6FYA
HI3JK	Julio, Dominica Republic - QSL to F6FNU, 14 MHz SSB
CO2HQ	Ray in Havana, 14 MHz SSB - QSL to XE1XF
VP2EXX	Paul on Anguilla, has new QSL Mgr KC8JH
C6AAA	Don on Bahamas, 14 MHz SSB - QSL to callbook address
7X4BL	Boucif in Algeria, 21 Mhz SSB - QSL to DF9EP
9X5KP	Colin in Rwanda, 14 MHz SSB - QSL to W4IEN
S92LB	Louiz, on the Sao Tome Island, Africa - QSL to Call Book address.
GD4WBY	Mike on the Isle of Man, 14 MHZ SSB
V47RF	Reg on Nevis Island (Caribbean) - QSL to WA2SPL, 21 [illegible]
J88AQ	Bill on ST Vincent, 3B9FR Robert on Rodriguez Island - QSL to F6FNU
FY5AN	Chris in French Guiana. QSL to Call Book address, 14 MHz SSB
FM5EB	Dominique on Martinez Island - QSL to Call Book address
OH2BH/P/EA8	Martii, the well known Finnish DXer, holidaying on the Canary Island - QSL to home call
4LØX	QSL to UAØIAP
ZS8MI	Peter on Marion Island 21 MHz SSB - QSL to ZS6PT
CT3AB	Henrique on Madeira Island, 14 [illegible]
TL8WD	Dieter in Central African Republic - QSL to DL8CM
HG8EAC	Special prefix commemorating the European Air Champronships in Hungary. The call sign was on air in August - QSL to HA8IB
KHØAC	Len on Saipan, 14 MHz SSB - QSL to W7ZA
HC8JG	Iama on Galapagos Island - QSL to WA6ZEF
CYØDXX	Special prefix in connection with a 24 hours DXpedition on Sable Island, a small speck of island off the East Coast of Canada - QSL to VE1AL, 14 MHz SSB
SV9ADO	Kosta on the Island of Crete, 14 MHz SSB - QSL to PO Box 2270, Iraklion, Crete, Greece
WB3KBZ/VP9	Frank on Bermuda - QSL to home call, 14 MHz SSB
CM2ED	El in Havana, 28 MHz SSB - QSL to Box 34043. Havana, Cuba
IX1BGJ	In the North West part of Italy, Aosta Region, quite a rare prefix
S79MX	Kurt, holidaying on Sechelles, 21 MHz SSB - QSL to HB9MX
TA1E/P2	Aziz - QSL to callbook address
SØ1A	Western Sahara Democratic Republic - QSL to EA2JG
ZF2NZ	Grand Caymen Island - QSL to KA2UHS
LX9CFL	Emil in Petange, Luxembourg, Club Station of FIRAC Railway enthusiasts
OH2AQ/OHØ	Pekka on Aland Island, 14 MHz SSB - QSL to OH2NRV
FF1OSB	Jackie, the well know French DXer, operating the Club Station of the French DX Foundation
XX9SW	Macau - QSL to KU9C
V85NR	14 MHz SSB - QSL to Huw Roberts, PO Box 572 Kuala Belait Brunei
CR8LN	Paul with special prefix - QSL to CT1LN
J52US	Dave in Guinea Bissau - QSL to WA8JOC, 14 MHz SSB
P4ØMA	Bill on Aruba Island - 14 MHz SSB. QSL to WJ7X
CT3EU	Dick in Funchal, Madeira on holiday - QSL to G3PFS
KNØE/KH3	Peter on Johnson Island, 14 MHz SSB. QSL to K9UIY

Africa and the ANZA Net

This net has been established for over twenty years, and is operating every day at 0500 UTC on 21205 MHz. The present Net controller is Percy VK4CPA. If you are interested in working African and other exotic stations, join the net.

The following stations show up on the net from time to time

FR4FD, ZS6P, ZS5OV, ZSZRW, VKØGC, TL8WD, 5Z4BH, FR5ZD, 7X4BL, TU2UI, ZS8MI Z21BP, ZS6LUX, Z21DB, ZS3GB, ZB2AZ, ZS5K, ZS6BGJ, 9M2HB, A92BE. Incidentally, the name ANZA stands for: Australia, New Zealand, Africa Net.

80 Metres

I was fortunate to work KNØE/KH3 on this band in the CW mode The DX "window" on this band is quite active. A small group of VK2, VK3, and VK5 amateurs have regular contacts now with the west coast US stations, around 1000 UTC

News From Here and There

T3ØXAC - QSL Mgr is AA6BB/P7 (The VU2 QSL Bureau does not operate).

4L1NV - QSL to UB5IMD (QSL direct or to managers)

FT4ZE - Michelle on Amsterdam Island - QSL to F2CW

H44JL - QSL to PO Box 63, Honiara.

ZL2VS "Dusty" - will be on Chatham Island from 15 January 1990 to 29 January 1990. He will operate mainly on CW under the call ZM7VS.

Z21BA - QSL to N5FTR

Micronesia prefix has been changed from KC6 to V6

Marshall Islands have a new prefix - V7.

VP8BQE - on Adelaide Islands Antarctica, was active on SSB 80 metres, and had QSOs with VK and W6 stations.

CY9SPI - was active on St Pauls Island for 24 hours - QSL to VE1YX

P29CG - QSL to WB9SVK

HL9FN - QSL to WD4IFN.

QSL Cards

If you sometimes wonder whether you will successfully receive the QSL card from that rare DX station, here is a list of cards received, (mostly direct) So, do not give up hope, your card could be in the mail

3WØA, T3ØRA, TPØCE, SMØIG/YN, KV4AD/PJ6, HL88ASS, VP2MC, 3DAØAU, J6LMA, HR1KAS, 3B9FR, TR8SA, TL8WD, VP8BWL, VE8CB, ZF2NV/ZF8, XF4F, ZS1IS, ZP1XCP, VP2EXX, VP47NXX ,3D2XV, H44/VK3ERD, 8P6CC, VO2AC

73, and good DX-ing

Stolen Equipment

Stolen 1st August from the home of Phill VK2XPU 1 Yaesu FRG7700 receiver serial no 3M260983, an electric winder, Olympus OM4 and associated lenses and equipment, a Fuji KCA 60 Box, and a Canon PC10 copier Phill had been helping with the Amateur Radio lecture run by the Gladesville Amateur Radio Club and discovered the robbery on his return home.

If you are offered any of these items, please contact your local Police station.

VHF/UHF

An Expanding World

Eric Jamieson VK5LP
9 West Terrace
Meningie 5264

All times are Universal Time Co-ordinated indicated as UTC

Australian Amateur Bands Beacons

Freq.	Call Sign	Location	Grid Square
50.056	VK8VF	Darwin	PH57
50.066	VK6RPH	Perth	OF78
52.200	VK8VF	Darwin	PH57
52.320	VK6RTT	Wickham	OG89
52.325	VK2RHV	Newcastle	QF57
52.330	VK4RGG	Geelong	QF21
52.345	VK4ABP	Longreach	QG26
52.370	VK7RBT	Hobart	QE37
52.420	VK2RSY	Sydney	QF56
52.425	VK2RGB	Gunnedah	QF59
52.435	VK4RMV	Hamilton	QF12
52.440	VK4RTL	Townsville	QH30
52.445	VK4RIK	Cairns	QH23
52.450	VK5VF	Mount Lofty	PF95
52.460	VK6RPH	Perth	OF78
52.465	VK6RTW?	Albany	OF84
52.470	VK7RNT	Launceston	QE39
52.485	VK8RAS	Alice Springs	PG66
144.022	VK6RBS	Busselton	OF76
144.400	VK5RTT	Mount Mowbullan	QG62
144.410	VK1RCC	Canberra	QF44
144.420	VK2RSY	Sydney	QF56
144.430	VK3RTG	Glen Waverly	QF22
144.445	VK4RIK	Cairns	QH23
144.445	VK4RTL	Townsville	QH30
144.465	VK4RTW	Albany	OF84
144.470	VK7RMC	Launceston	QE39
144.480	VK8VF	Darwin	PH57
144.485	VK8RAS	Alice Springs	PG66
144.530	VK3RGG	Geelong	QF22
144.550	VK5RSE	Mount Gambier	QF02
144.600	VK6RTT	Wickham	OG89
144.800	VK5VF	Mount Lofty	PF95
432.066	VK6RBS	Busselton	OF76
432.160	VK6RPR*	Nedlands	OF78
432.410	VK1RBC	Canberra	QF44
432.420	VK2RSY	Sydney	QF56
432.440	VK4RSD	Brisbane	QG62
432.445	VK4RIK	Cairns	QH23
432.445	VK4RTL	Townsville	QH30
432.450	VK3RAI	MacLeod	QF22
432.535	VK3RMB	Mount Bunnyong	QF12
432.540	VK4RAR	Rockhampton	QG56
1296.198	VK6RBS	Busselton	OF76
1296.410	VK1RBC	Canberra	QF44
1296.420	VK2RSY	Sydney	QF56
1296.440	VK3RSD	Brisbane	QG62
1296.445	VK4RIK	Cairns	QG23
1296.480	VK6RPR*	Nedlands	OF78
2304.445	VK4RIK	Cairns	QH23
2306.440	VK4RSD	Brisbane	QG62
10445.00	VK4RIK	Cairns	QH23

? Operation Doubtful

* Note With the exception of the six metre beacons, it appears the Perth beacons are in a state of limbo at the moment pending relocation. Although still listed you are advised they may not be available in the short term.

Six Metres

For most of the month the six metre band has been relatively quiet. Personally, I have observed about 5 openings to VK4 with the better signals received from northern Queensland. My old friend Wally VK4DO at Airlie Beach was very strong on a couple of occasions, but I was too busy with important matters to allow myself to become involved!

Phill Hardstaff FK1TS has written to say that he is now back on Australia, and now signs VK3XGK form Lower Plenty While in Noumea Phill made more than 3000 contacts in twelve months. He received his QSL from BY4RB which was a pleasant surprise and also one from Warwick ZK1WL who thought that their contact was probably the first six metre contact out of the North Cooks Islands. Does anyone know of another?

Before leaving Noumea, he managed the first FK to anywhere EME contact on two metres with W5UN Phill used an IC290H without preamp and an 8 element Jaybeam Quad antenna Transmitter power was 150 watts and he was really excited about the contact. Good work.

The Japanese magazine "CQ ham radio", courtesy VK6RO indicates a number of interesting contacts for the period 16/4 to 24/5 with stations worked including ZL7TPY, PP5WL, KX6DS, FK1TS, VS6AK, FOØAQ, T2ØJT, 5W1GW, 4F3BAA, KG6DX, 5H1HK, HL4MC, 3D2ER, KC6IN, DU1GF, YB1CHG, ZS3AAU, ZS2AGI, ZL3NE, H44GR, VQ9LW, YJØAMI,BY5RA, T33JS, P29PL, LU, KH6, W and VK. That represents a rather imposing list, and I have only extracted one call sign from each area, so there are many more It seems odd that the JAs do not appear to work into the Caribbean area in the same way that VK stations have achieved, it is obvious the JAs can work Africa more easily than VK, so perhaps someone is sharing the contacts around!

Further QSL Information

CX8BE:	Gorge de Castro Box 71, 11000 Montevideo, Uraguay
FO4NK:	Alain Salic, SP 91381, F-75998, Paris Zarmees, France.
FOØAQ:	Box 11397 Mahina, Tahiti.
KC6IN:	Isao Nishimura, Box 296, Ponape, EC1 TT 96941
KC6TY:	via JG1RVN

KX6DW:	via KX6BU
PP5WL:	Adolfo Adao Thiede Ruatiradentes 402 Box 39 89160 Rio do sul SC Brazil.
T33JS:	via JA1BK
VO9LW:	via WA2ALY
YJ0AMI	via JL1RUC
YJ0ATH:	via JH8FAJ
YJ0AYT:	via JG1UZD
ZS1EK:	W J Dewey, 39 2nd Ave, da Gamer Park, Simonstown 7995, South Africa.
ZS4AAB:	R V R Handfield Jones, 19 Gazelle Ave, Lime Acres 8410, South Africa
3D2ER:	Raj Singh, Box 184 Suva Fiji Island.
4F3BAA:	via JG2PUW
5W1HC:	via JH4IFF

The Melbourne Scene

John VK3ZJC has written a letter covering a number of areas.

Several new 1296 MHz stations have appeared and there are now 31 VK3s. Those believed to be using SSB include VK3BH, 3ATW, 3AUI, 3BBU, 3KAJ, 3KAQ, 3KKW, 3KZZ, 3XRS, 3YTV, 3ZAT, 3ZGJ, 3ZJC and 3ZPW. Others on the band are 3WH, 3AHJ, 3AIY, 3AMZ, 3AUX, 3KJN, 3YJM, 3YLH, 3YLV, 3YMP, 3YNB, 3ZBJ, 3ZHP, 3ZNE, and 3ZYN. The country stations are 3KZZ and 3YLV at Horsham, 3XRS Balmadale, 3YJM Carlsbrook and 3YNB Ballarat.

John makes several points which are worth passing along. Two local amateurs recently purchased 1296 MHz FM gear and received copies of the WIA band plan. After making many calls on the FM calling frequency in the band plan (1252.5 MHz) and receiving no replies they have now migrated to 1296.1 and found stations to work.

John sees a potential problem here. With new stations coming on 1296, mostly on FM, they will naturally gravitate to any frequency which has some use. The only active frequency for many years has been 1296.1 and some stations use FM on it, but in fact, it is the SSB/CW DX calling frequency. Its use would be severely compromised if any number of new FM operators appeared and turned it into an FM net.

It seems very desirable that more publicity should be given for the FM nets between 1252 and 1253 MHz, especially the primary calling frequency of 1252.5 MHz. In this way, mutual interference between the modes can be avoided before the use of the frequency becomes firmly established.

Also, despite being shown in repeater listings, there appear to be no 23 cm repeaters in operation, unless that shown in Brisbane on 1281.65 input and 1293.65 output is actually in operation. However, these frequencies clash with existing ATV operating practice. The band plan shows ATV channels on 1246.25 and 1287.25 but no-one appears to use these frequencies! There is little ATV on 1296 but what there is has always been on 1290.25, which corresponds to a Channel 5A IF for a 1296-144 MHz transceiver or converter. John, therefore, believes it would be logical to enshrine it in the band plan - no-one will follow band plans if they don't take into account existing practice.

23 cm Band Planning

John VK3ZJC also says that the 23 cm band plan bears little resemblance to reality - the 1296.1 calling frequency is about the only part of it that agrees in actual practice.

It appears that at present repeaters are not permitted in the band despite a change from 20 MHz offset to 12 MHz for the specific purpose of fitting around the radar guard band and the satellite band. If they are not acceptable between 1240 and 1260 MHz then where will they be acceptable? Then again, do we need repeaters on 23 cm, after all? It is probably the lowest band where there is any genuine experimentation taking place.

Contests

Last year the Federal Contest Manager instituted a VHF-UHF Field Day Contest which received a reasonable degree of support. I understand from John VK3ZJC that there is not likely to be one this year, as the FCM said there had been no confirmation of approval from the Federal Convention where the matter was raised. Should this be so, it seems a pity that the Contest should fall by the wayside due to any formalities which may have been overlooked.

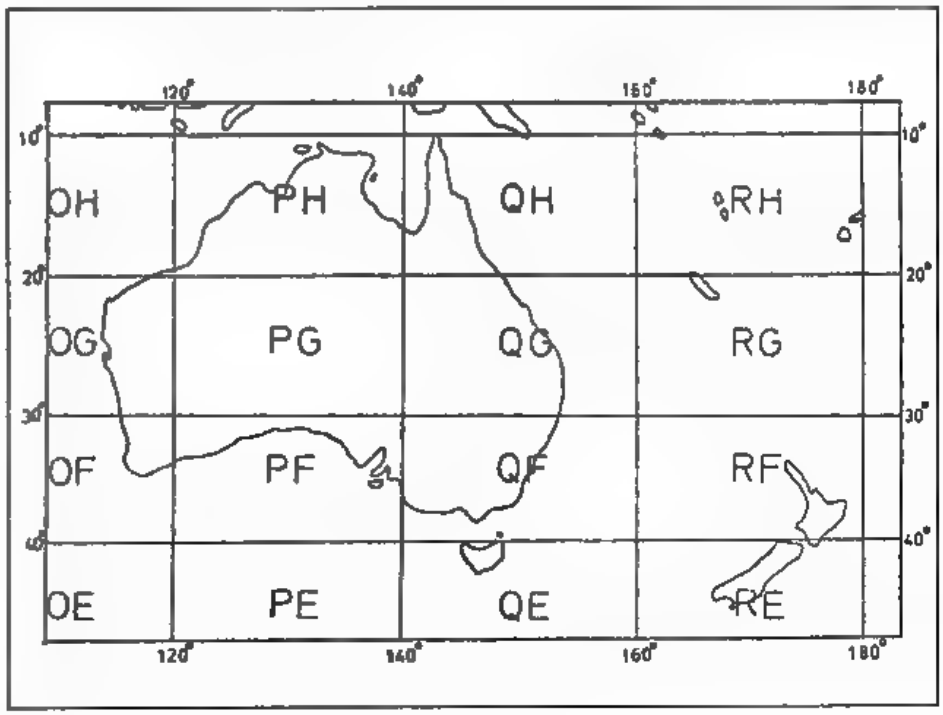
The July issue of AR carried advance notice that the Ross Hull Memorial Contest would be staged again this summer, and for a projected period of three weeks. While the fine print has not yet appeared, the forward notice says that the frequencies which may be used are all authorised amateur bands above 30 MHz.

Maidenhead Locator Squares

During the Ross Hull Contest last year there was a general reluctance on the part of many operators to swap Locator Square numbers. This may have been due in part to many not knowing in which square they lived. The subject of the locator system was outlined in November 1983 AR. However, there were some errors made during the transposing process from the northern to southern hemispheres, so that corrected tables were published in February 1984 AR, but the large square map in the November issue was correct and will be required for use with the tables of the February issue. The relevant information is repeated in this issue and this should enable you to work out your square, providing you know your latitude and longitude.

I have a Concise Family World Atlas for Australia and New Zealand published by George Philip & Son Ltd and obtained it from Time Life Books. (A similar publication by the same people is known as the Golden Concise World Atlas and may be more readily available.) Both have a large part of Australia in divisions of 1 x 1 degrees and I have drawn lines to the required 2 x 1 degrees on the appropriate maps using see-thru marker pens, so that I now have quite an accurate read-out of locator squares to four places for the whole of Australia and New Zealand. If the full six places of the system are required then, to use the appropriate tables, you must know precisely what your position is on the earth.

In return for a stamped self-addressed envelope I am prepared to advise anyone of their locator square to four places, provided the following information is enclosed: the name of your town and the longitude and latitude if known. If a small settlement or town - the distance and direction to the nearest large centre, so that I can have some idea where you live, in case your place is not marked on my map. For those people who live close to the 2 and 1 degree



The Longitude/Latitude Locator System Map

borderlines, there is a possibility of error if you cannot supply longitude and latitude. Once in possession of the first four parts, you should be able to work out the final two from the tables in AR

I am currently considering producing a chart which would list the locator squares for every 2 x 1 degree segment of Australia and New Zealand. This would allow the majority of people to know their position to four places. Those on or near the borders of the segments would need to know their longitude and latitude to ensure they can accurately define their position. More on this later.

Closure

As these notes were closed off on 23 August, the amount of available news has been reduced. The need for the early closure is the necessity for surgery on my back, in an effort to keep me walking. Hopefully, I can be back on deck again from about mid-September to be around when the 50 MHz DX becomes available.

Closing with two thoughts for the month: "Opinions should be formed with great caution - and changed with greater", and "Few things are harder to do secretly than to stub your bare toe on the bedpost!" 73, from the Voice by the Lake.

Locator Squares Details

The first two letters. These are found from the map.

The third character. This is determined by your longitude in degrees east as follows:

Longitude degrees east	Third character	Longitude degrees east	Third character
110-111	5	146-147	3
112-113	6	148-149	4
114-115	7	150-151	5
116-117	8	152-153	6
118-119	9	154-155	7
120-121	0	156-157	8
122-123	1	158-159	9
124-125	2	160-161	0
126-127	3	162-163	1
128-129	4	164-165	2
130-131	5	166-167	3
132-133	6	168-169	4
134-135	7	170-171	5
136-137	8	172-173	6
138-139	9	174-175	7
140-141	0	176-177	8
142-143	1	178-179	9
144-145	2	180-181	0

The fourth character:
This is determined from your latitude in degrees south as follows:

Longitude degrees south	Fourth character	Longitude degrees south	Fourth character
10	9	30	9
11	8	31	8
12	7	32	7
13	6	33	6
14	56	34	5
15	4	35	4
16	3	36	3
17	2	37	2
18	1	38	1
19	0	39	0
20	9	40	9
21	8	41	8
22	7	42	7
23	6	43	6
24	5	44	5
25	4	45	4
26	3	46	3
27	2	47	2
28	1	48	1
29	0	49	0

The fifth character:
This is determined by your minutes of east longitudes as follows:

Minutes of Longitude east	Even minutes	Odd minutes
0-5	A	M
5-10	B	N
10-15	C	O
15-20	D	P
20-25	E	Q
25-30	F	R
30-35	G	S
35-40	H	T
40-45	I	U
45-50	J	V
50-55	K	W
55-60	L	X

The sixth character:
This is determined by minutes of latitude south as follows:

Minutes of Latitude south	Sixth character	Minutes of Latitude south	Sixth character
0-2.5	X	30.0-32.5	L
2.5-5.0	W	32.5-35.0	K
5.0-7.5	V	35.0-37.5	J
7.5-10.0	U	37.5-40.0	I
10.0-12.5	T	40.0-42.5	H
12.5-15.0	S	42.5-45.0	G
15.0-17.5	R	45.0-47.5	F
17.5-20.0	Q	47.5-50.0	E
20.0-22.5	P	50.0-52.5	D
22.5-25.0	O	52.5-55.0	C
25.0-27.5	N	55.0-57.5	B
27.5-30.0	M	57.5-60.0	A

Example

The former VK5LP location at Forreston was longitude 138 deg 54' 21.2" east, latitude 34 deg 47' 39.3" south. Thus, for the original map the first two characters are PF

The third character is determined from the 138 degrees of longitude and from Table 3 becomes 9

The fourth character is determined by the degrees of south latitude and being 34 becomes a 5 from Table 4.

The fifth character is determined by the minutes of longitude east and being 54 becomes K from Table 5. (Had the figure been 55 then the 21.2 seconds would put the figure ABOVE 55, so it would have been L.) The sixth character is determined by the 47 minutes of south latitude.

At first on reference to Table 6 one might say the sixth character is F.

But the 39.3 seconds indicates over the half minute (30 seconds), so the 47 needs to be read in the section 47.5 to 50.0 which is E. So my location using the tables was PF 95 KE.

ar

Plea to Senders of QSL Cards

Where a manager does the work of answering QSLs on behalf of an operator, PLEASE mark or highlight his callsign on the card. So many Bureaux take the easy way out and send the card to the other bureau. And many managers have not made any arrangements to receive cards from the bureau. For example, only three operators in the last seven years have notified the Federal QSL Bureau of where to send their cards, and have included postage to cover their delivery. Before you write asking what happens to all the other cards, here is the answer.

VKØ cards, where the home call of the operator is unknown, are sent to ANARE in Tasmania. DOTC refuse to tell the WIA their home call! VK9 cards are despatched to the operators home call at WIA expense. So far, with help from many sources, these have all been found. In the case of VKØ callsigns, many do not have an Amateur Callsign before, and sometimes after, returning to Australia. So, if you have a contact with a VK9 or VKØ, find out his/her home callsign and write it on the card please.

Good DXing

Neil VK6NE
Federal QSL Manager

China Color TV Standards

Color TV receivers made in China must be able to operate at least 15,000 hours before breaking down under new standards issued by the government. This was among a number of standards covering reliability, sound and picture quality, and electronics design, announced by the vice minister of machinery and electronics industry, Zhang Xudong. China claims to be the world's third-biggest maker of color TV sets after the United States and Japan. It produced 10.27 million sets last year with most of them exported and sold under non-Chinese brand names. ar

Computer Hackers Challenged

Nippon Telegraph and Telephone (NTT) of Japan has offered a one million-yen prize to any hacker who can beat its coded communications system within two years. An NTT spokesperson said he does not think anyone can decipher the FEAL-8 system and that the prize money was not designed to provoke hackers. However, computer buffs were free to try and in the extremely unlikely event of them being successful their efforts would point out any system defects. ar

CONTESTS

Calendar, Rules ALARA, OK-DX Contests

Frank Beech VK7BC
Federal Contest Manager
37 Nobelius Drive
Legana 7277

Contest Calendar

October:

7-8 VK/ZL Oceania DX contest SSB section
8 RSGB 21/28 MHz SSB contest
9 RSGB 28 MHz contest
14-15 VK/ZL Oceania DX contest CW section (rules for both in Sept "AR")
16 RSGB 21 MHz CW contest

November:

11 ALARA annual contest (Rules this issue)
11-12 Czechoslovakian DX contest (Rules this issue)

The SSA has sent me the full results of the 1988 Scandinavian activity contest, these results make up a booklet of some 33 pages! In the non-Scandinavian sections the plaque winners are, by continent, CW: Africa EA5BS/EA8, Asia UZ9AWZ, Europe RB5IM, North America K3ZO, Oceania YB2CTW, South America HK1BAU, and in the phone section, again by continent. Africa DJØMW/CR3, Asia UA9TS, Europe LZ2PO, North America VO1SA, Oceania YB2CTW, South America YW1A. In our corner of the pond in the CW section the scores are: AX2BQQ 4312, VK4TT 945, AX4XA 874, VK2DID 153, Indonesia YB2CTW 9333, YB2FEA 7980, YB3ASQ 48, No Kiwis on CW.

In the phone section AX1RJ 276, VK3DHV/2 90, YB2CTW 3910, YB9ASQ 240, ZL1AAS 19080.

I could not find any entries from around these parts mentioned in the QRP section. By the time these notes are being read by our membership, 1989 contest will have been run, so please do send in your log and let's try and get one of the plaques into VK next year.

I have received one or two letters from amateurs who have seen their callsigns mentioned in this column as winners in some of the various contests run by overseas societies. To answer these queries I must state that I do not distribute certificates for any overseas societies, nor do I receive the results, but occasionally do receive such information from various sources. When I do, I will publish them. The majority of overseas societies will send the certificates to contest winners by surface mail in due course, so a lot of patience is required.

Please note that in the rules for the forthcoming ALARA contest, the scheduled time for this event to commence is 0002 UTC on Saturday 11 November 1989. This time allows two minutes silence to commemorate Armistice day. The 11th hour of the 11th month 1918.

ALARA Contest

Eligibility

All licensed operators throughout the world are invited to participate. Also open to SWLs.

Object

Participation. YL works everyone, OM works YLs only. One contest (combined phone and CW) run over 24 hours.

Starts: Saturday 11 November 1989 at 0002 hours UTC

Ends: Saturday 11 November 1989 at 2359 hours UTC

Suggested Frequencies:

Bands to be used are 3.5, 7, 14, 21 and 28 MHz only. The following are suggested frequencies for easier location of contacts:

28.100 to 28.350 28 500 to 28 600
21 100 to 21 200 21 350 to 21 370
14 060 to 14 235
7 100 to 7 120
3 525 to 3 590

Operation:

Phone and CW operation. Each station may be counted twice on each band for credit: once on phone and once on CW. All contacts must be made in accordance with operator and station licence regulations. No net or list operation, no crossmode.

Procedure:

Phone: Call "CQ ALARA CONTEST"
CW: YLs call "CQ TEST ALARA"
OMs call "CQ YL"

Exchanges

ALARA Member: RS or RST serial no

starting at 001, ALARA member name

YL non-member or OM: RS or RST, serial no starting at 001, name.

Scoring:

Phone. 5 points for ALARA member contacted
4 points for YL non-member contacted
3 points for OM contacted

CW: Double all points for CW contacts

SWL: 5 points for ALARA member logged
4 points for YL non-member logged

Logs: Single log entry (but Australian YL novices entering for the Mrs Florence McKenzie CW trophy should indicate their CW score separately also) Logs must show date/time UTC, band, mode, callsign worked, report and serial number sent, report and serial number received, name of operator of station worked, and points claimed.

Sample Log:

Date/Time UTC	Band Mode	Callsign	RS(T) & Serial No Sent	RS(T) & Serial No Sent	Name	Points
14/11 0135	28 SSB	VK3EBX	59001	58026	Joy	5
14/11 0141	21 CW	VK3KS	599002	599045	Mavis	10
14/11 0800	14 SSB	FK8FA	59025	59011	Aimee	5

Logs Must Be Signed:

Logs also to show full name, callsign and address of operator, and show final score (points claimed.) Logs must be legible. No carbon copies. No logs will be returned. Decision of the Contest Manager will be final. Logs must be received by the Contest Manager by 31 December 1989

Contest Manager:
Mrs Marilyn Syme VK3DMS
PO Box 91
Irymple 3498
Vic Australia

Mrs Florence McKenzie CW Trophy:

This will be awarded to the Australian YL novice operator with the highest CW score (not necessarily an ALARA member) Minimum score 50 points. The actual trophy, because of the size and weight, will not be forwarded to the winner, but a certificate bearing a photo depicting the trophy will be sent to the winner each year.

Certificates:

Will be awarded for the following.

Top score overall
Top score phone only
Top score Australian YL novice CW (Mrs F McKenzie Cert)
Top score ALARA member in each country and VK call area
Top score YL non-member in each continent
Top score OM in each continent
Top score SWL in each continent
Top score VK novice
Top score overseas YL novice CW

(Mrs Florence Violet McKenzie, 1892-1982, was the first woman in Australia to take out a transmitting licence in 1921 She passed the Amateur Operator's Certificate of Proficiency in 1925 and obtained the callsign 2GA (later VK2FV) Mrs Mac taught Morse code to thousands of people, particularly service personnel during the 1939-45 war years. In 1984 the Townsville Amateur Radio Club kindly donated a trophy in her memory)

OK-DX-Contest

The Czechoslovakian Central Radio Club has the honour to invite amateurs all over the world to participate in the annual OK DX Contest.

1 : Contest Periods

Every second full weekend in November
1988 - 12/13 November
1989 11/12 November
1200 UTC Saturday to 1200 UTC Sunday

2 : Mode

CW and Phone

3: Bands

1,8 - 3,5 - 7 - 14 - 21 - 28 MHz

4: Categories

A - single operator all bands
B - single operator single band
C - multi operator all bands (club stations)
D - SWL

Any station operated by a single person, obtaining assistance such as keeping the log, monitoring other bands, tuning the transmitter etc, is considered as a multi operator station

Club station may compete in category C only. Only one transmitter and one band is permitted during the same time period (defined as 10 minutes rule) That means a station can change the band after ten minutes of operation on it.

5 : Contest Exchange

Signal report (RS or RST) and number of ITU zone.

6 : Scoring

A station may be worked once per band regardless of the mode. Crossmode and crossband contacts are not valid.

1 point for a complete contact with other DXCC country,

3 points for a complete contact with OK/OL station (OK4/MM counts 1 point for everyone)

0 point for a complete contact with own DXCC country (counts only as a multiplier)

7 : Multipliers

Sum of different ITU zones worked on each band.

8 : Final Score

Total QSO points from all band times sum of the multipliers.

9 : Log Instructions

a) All times must be in UTC
b) Indicate zone multiplier only the first time it is worked on each band.
c) Logs must be checked for duplicate contacts, correct QSO points and multipliers
d) For each duplicate contact or multiplier that will be removed from a log by the commit tee, a penalty of three additional contacts of the same points will be exacted.
e) Use a separate sheet for each band.
f) Each entry must be accompanied by a summary sheet showing all scoring information, category, contestant's name and address and a signed declaration that all contest rules and regulations for amateur radio in the country of operation have been observed.
g) All entrants are encouraged to submit cross-check sheets for each band on which 200 or more QSOs were made.

10 : Awards

First place certificates will be awarded in each category for TOP scoring station in each DXCC country All scores will be published.

The "100 OK", "OK SSB" and "SLOVENSKO" awards may be issued upon a separate application (no QSL cards are required for contacts made during OK DX Contest.)

11 : Disqualification

Violation of amateur radio regulations in the country of contestant or the rules of the contest, operation in an unsportsmanlike manner, manipulating scores or times to achieve a score advantage, unverifiable contacts and multipliers are grounds for disqualification Decisions of the Contest committee are final.

12 : Deadline

All entries must be postmarked no later than December 15, and should be mailed to The Central Radio Club, PO Box 69, 11327 PRAHA 1, Czechoslovakia.

We do hope to meet you in the OK-DX-Contest next year again and please kindly inform your friends about the rules of the contest. Any picture from the contestants will be appreciated Many thanks for your log and participation. Contest Manager is OK2FD.

From E J Mulholland VK4AEM
Queensland Contest Manager

Sunshine State Jack Files Memorial Contest 1989

Results

Section 3 . Stations Within VK4

a) Tx All Bands:

VK4VR	883	VK4ANN	139
VK4PJ	261	VK4GUY	132
VK4BAW	162	VK4AHO	99

b) Tx HF Phone:

VK4NLV/M	1737	VK4SSB	793
VK4KEL	1132	VK4DRM	617
VK4YB	942	VK4NFE	398
VK4BB/M	906	VK8AV/4	335
VK4ADD	842	VK4OD	240

Check Log, VK4AOE, VK4IY

c) Tx HF CW:

VK4VXX	122	VK8AV/4	20

d) Tx V/UHF Only:

VK4RX	76	VK4ZXZ	38

e) Club Stations.

VK4WIE/M	2779	VK4WIX	630
VK4RC	1011	VK4WIM	522
VK4BPA	775	VK4WIZ	196
VK4WIC	717		

Section 4 . Stations Outside VK4

a) Tx All Band Phone:

ZM3KR	758	VK2BQS	150
VK2DJJ	508	ZL3TX	136
VK1BEB	238		

Comments:

There was greater participation than the number of logs indicates. Most participants offered helpful comments, and these will be considered I am grateful to those who took the time to pen their thoughts

The standard of logs was very high, one or two qualify for the accolade "outstanding" ar

Questionnaire Response, USSR Awards

Ken Gott VK3AJU
Federal Awards Manager
38A Lansdowne Rd
St Kilda
3183

Results of Survey of VK Awards

Last April I wrote to more than 70 managers of awards issued by VK divisions, zones, clubs and special interest groups, asking for up-to-date information on their awards.

The only comprehensive list of VK awards I had at the time was the one published in the WIA 1985-86 Callbook. It was then three years old and I suspected that some of the addresses were out of date and that some of the awards had collapsed. Letters from overseas amateurs complaining of non-acknowledgment of enquiries or applications concerning various VK awards confirmed my belief that an awards up-dating was needed.

So, in April I sent forms to the managers of all the awards listed in the WIA 1985-86 Callbook and to clubs, etc with awards subsequently notified to AR and reported in this column.

I must thank all who responded to my letters. The majority reported that the award in question was still up and running and most gave details of nets or broadcasts useful to those seeking to qualify for the award.

In some cases, respondents reported that their award was no longer available for one reason or another. That information is also useful since these dead awards can now be cleared not only from the WIA list, but also from worldwide directories of awards published in the USA, UK and elsewhere.

Some of my letters came back marked "return to sender", while others vanished into the void, drawing no response. (In all case, I sent a SASE for the enquiry form to be returned to me.)

The only awards that I have listed below as no longer being issued are ones for which I have been specifically advised that such is the case. Where my letters were returned unopened, or no response was forthcoming, I have listed the award as "missing, presumed killed".

Unless I hear from their managers by December 7, these awards will not be included in the listing which will appear in the February 1990 Special Information issue of Amateur Radio.

I will also advise editors of overseas guides to awards of the situation regarding these "missing, presumed killed" awards.

My questionnaires asked managers for the number of award certificates they had issued and for figures or estimates of how many of these had been sent overseas.

The highest tally reported was from the Redcliffe City ARC which has issued 718 certificates since its award was established in 1972. Almost 250 of these have gone overseas. The club obviously keeps good records, since it supplied a list of the 34 DX countries to which certificates had been sent and the number going to each country.

After that, the next high-flyer was the humorous DX Widows Award which requires no contacts, but merely your callsign and XYLs name, plus $2.00. Its custodian Maurie Batt VK3XEX says that 705 certificates have been issued since the award's inception in 1981 and that at least 50 of these have gone overseas to 29 different countries.

The next biggest tally was 470 for the Southern Cross Award set up in the 1970s by the Eastern and Mountain Districts RC in VK3. Close behind was the Tasmanian Devil Award, another certificate calling for serious effort. Since launching in 1990, 442 certificates have been issued, plus 82 upgrades. Both managers reported that numbers of certificates had been sent abroad.

The Festival City and VIPM (10/10) Award set up in 1979 has issued 405 certificates. This award is administered by Bill Vogel VK4NVW and as indicated a 10/10 award. (Perhaps an explanation of that is needed, but it will have to wait for a future column.) More than 300 of these awards have gone overseas.

A very high proportion of managers who responded to my enquiries gave details of nets associated with their awards, usually on 80 metres. I plan to include details of these nets in the awards listing in the February 1990 issue of this magazine.

Defunct Awards

Peacock
Australian Railways Charter
Whistle Stop (all VK3)
[illegible]
Blue Mountains Lagoon (all VK2)
Gun Valley and VIP (VK5)

Missing, Presumed Killed

Ace
[illegible]
St George
Worked Indian Ocean (all VK2)
Major Mitchell
[illegible]
Natural History
Power Valley (10/10)
[illegible]
Black Marlin
Brisbane ARC
Coral Sea
Gold Coast
Gold Coast Repeater 100
Gun Valley and VIP (10/10)
Pioneer Shire
SEQ Teletype Operators
White Bull
Worked North Queensland
Worked Rockhampton (all VK4)
Blue Lake
[illegible]
VK5 Whisky Charlie (all VK5)
WA Police
Western Keyboard Bashers
North West (all VK6)
Rev John Flynn
Worked Darwin
Worked VK8 (all VK8)

New USSR Awards

Earlier this year I mentioned some effects of Glastnost and Perestroika on amateur radio in the USSR (AR, May issue). I've now learned that several radio clubs are now issuing their own awards.

From time immemorial, the only USSR awards available came from Box 88, Moscow, but the ice was broken a few months ago when the Western Siberia DX Club announced an award series. I'm trying to obtain details of these awards, but in the meantime, some other new USSR awards have come to my attention.

One is the Trophy Ukraine for which the qualification is to contact each of the 27 Ukrainian oblasts on any two bands since 1 January 1988. That's a total of 54 QSOs and all modes are acceptable.

Ukrainian oblasts are: 057-060, 062-082, and 186-187.

Cards should not be submitted, merely a certified list. The fee is $3 or 60 IRCs, which is very high. However, I'm told that the award is in the form of a handsome wooden plaque. Applications should go to Victor Tkachenko RB7GG, PO Box 73, Kherson 325000 USSR.

ar

Have you advised the WIA Executive Office of your new callsign? Use the form on the reverse of the AR address flysheet.

POUNDING BRASS

Direct Conversion Receivers

Gilbert Griffith
VK3CQ
7 Church St
Bright 3741

I have had a few enquiries over the last month more more info on the CW Operators QRP Club. Kevin Zietz VK5AKZ (43) is the man to contact and his address is 41 Tobruk Avenue, St. Mary's, SA, 5032

Going back to last month and the Howes CVF80 VFO, you will be pleased to hear that the unit is still working, (I haven't blown it up yet!) and rock steady. Now, thanks to the short days and changeable weather, I can give you a short report on the matching receiver kit. The DcRx80 Howes Kit (courtesy DSE) is up and running and I have been listening!

For those of you who have no experience with direct conversion receivers, this is a very simple kit to build. OK I know you all know about the theory behind superheterodynes and long words like that, and we all have our tickets so we know all about how BFOs work, how to detect SSB etc etc - don't' we? But actually playing about with one of these things on air will probably have you confused at first. Mainly because of the number of signals you will hear, and the way you can hear them on either side of the beat frequency.

The theory goes like this: Your local oscillator is tuned to the frequency that you want to listen to, this is then mixed with the input from the antenna to give absolutely nothing. If, however, you tune the local oscillator slightly off the frequency you wish to hear, the difference in the two frequencies can be detected and amplified. The sum is usually removed by filtering, so if we tune the LO 1 kHz either side of the signal frequency we will hear a 1 kHz tone. Keep this point in mind as it can be quite convenient to be able to tune on one side or the other if there is a nearby station

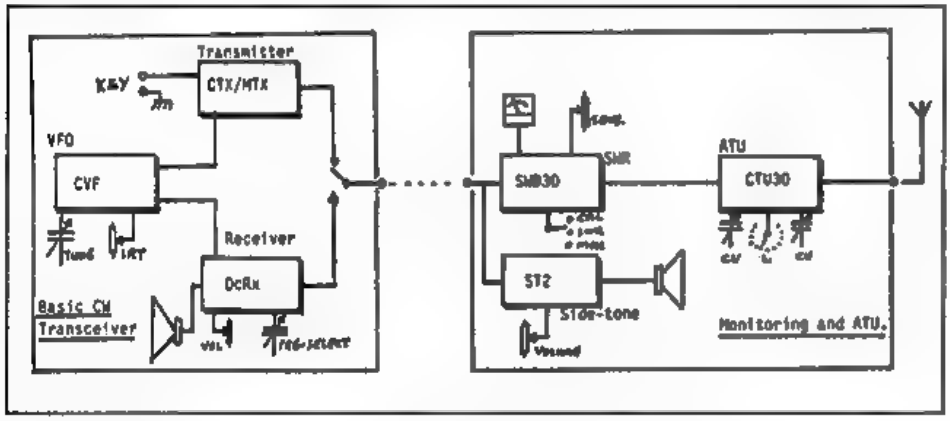
Back to the kit. The circuit board is smaller than the board for the VFO mentioned last month, and everything is supplied except the tuning capacitors, one for the preselector and one for the main oscillator I used the same type as I used in the VFO, that being a three gang BC type of about 300 pF The preselector capacitance is a bit on the high side but is great if you want to tune greater distances across the band. The main tuning can be adjusted from 1400 kHz to over 4.3 MHz using the pre-wound coils and their tuning slugs without any further modification, but I added the same 150 pF poly capacitor in series with the tuning capacitor to give exactly the same tuning as the separate VFOs, and by using the external one I can tune for zero beat, and then use the RIT for the best tone on either side of the transmit frequency. The main tuning can then be used for split operation

My other DC receiver is the Drew Diamond DC86 (AR October 1986) and at this stage it has the edge over the DcRx80 but only because of its audio filter section, and only temporarily because Howes Communication have just sent me their ASL5 audio filter kit for review, so that will be in the next article. Let's face it, there is not much you can do to make DC circuitry differently, and the add-ons, like meters, filters and amplifiers are really only bells and whistles.

Coupling together of the CTX80 transmitter, CVF80 VFO, DcRx80 receiver and ASL5 filter should provided a reliable transceiver for QRP work on 80 metres, and more importantly, assembling the kits will provide a working knowledge of radio principles that will be hard to forget. Further compatible kits are available, such as S meter, SWR/power meter, ATU, Xtal calibrator etc, so your transceiver could have all the features of a commercially built unit should you so desire.

Kits, some will say, are not real homebrewing. This may be true But they are an easy way of learning, especially about homebrewing, and provide experience which will benefit your own design ideas, without the hassle of chasing parts all over the country and fabricating your own circuit boards. Even if you do not feel competent using a soldering iron, you could still attempt these kits with assurance and then go on to better things having mastered the basics.

Before I close this month, I want to ask you a question. Do you lend your copy of Amateur Radio to non-members? Think about whether you are doing the right thing by yourself if you do. I personally don't like the idea of spending my time writing for AR, as well as paying my WIA membership fee, if non-members are going to reap the benefits as well. ar



Bill Martin VK2COP

Publications, Oscar 13, MICROSATS

Maurie Hooper VK5EA
11 Richland Road
Newton SA 5074

National Co-ordinator
Graham Ratcliff VK5AGR

Information Nets

AMSAT Australia
Control: VK5AGR
Amateur Check In: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz

AMSAT SW Pacific
2200 UTC Saturday, 14,282 MHz

Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia net. This information is also included on some WIA Divisional Broadcasts.

AMSAT Australia Newsletter and Computer Software

The excellent AMSAT Australia Newsletter is published monthly by Graham VK5AGR on behalf of AMSAT Australia and now has about 300 subscribers. Should you also wish to subscribe, send a cheque for $20 payable to AMSAT Australia addressed as follows:

AMSAT Australia, GPO Box 2141, Adelaide 5001

The Newsletter provides the latest news items on all satellite activities and is a "must" for all those seriously interested in amateur satellites.

Graham also provides a Software Service in respect to general satellite programs made available to him from various sources. To make use of this service, send Graham a blank formatted disk and a nominal donation of $10 per item to AMSAT Australia together with sufficient funds to cover return postage. To obtain details of the programs available and other AMSAT Australia services send a SASE to Graham

AMSAT-UK Publications Etc

Graham VK5AGR will not be importing publications etc from AMSAT-UK now Visa and Mastercard facilities are available. You are requested to send your orders direct to Ron Broadbent G3AAJ at AMSAT-UK. Graham will still be happy to supply you with a current catalogue of available items. Also, Ron has kindly agreed to supply goods to subscribers of the AMSAT Australia newsletter at the same prices applying to members of AMSAT-UK. all you need to do is include your latest newsletter address label with your order to establish your bona fides. For further information, please contact Graham

Oscar 13 News

Smoothed Keplerian Element Set

James Miller G3RUH has supplied a new set of smoothed elements for AO-13.

Epoch (1989)	212.26363100
Drag	0
Inclination	57.2900
RAAN	197.4804
Eccentricity	0.6682000
Arg of Perigee	208 5085
Mean Anomaly	0
Mean Motion	2.09699346
Orbit No.	864

Latest AO-13 Schedule
16 August 1989 until 16 November 1989
[illegible]

Mode B:	MA 003 to MA 160
Mode JL:	MA 160 to MA 200
Mode B:	MA 200 to MA 240
Off:	MA 240 to MA 003
Mode S:	MA 201 to MA 204 (beacon)
Mode S:	MA 204 to MA 217 (transponder)

On 18 August, Graham VK5AGR completed the magnetorquing to change the spacecraft attitude, and James G3RUH determined the new orientation. ON 18 August (day 230) the attitude estimates were:

BLON 209.1 deg, with a drift rate of +0 018 deg/day

BLAT 1.4 deg, with a drift rate of -0.064 deg/day

Mode S Operation Status

The following item is from AMSAT-NA Bulletin 232.01 of 20 August:

Strong AO-13 Mode S Signals Heard with "Normal" Mode B Uplink Power Levels

As reported last week in a AMSAT News Service (ANS-224.01) bulletin, Peter Guelzow DB2OS with the assistance of ON6UG, G2BFO and DF5DP, was able to figure out a way to shut down the Mode S beacon on OSCAR-13 during normal pass - band communications on the Mode S transponder. From the very beginning, the Mode S transponder's beacon was designed to shut off when the transponder operations commenced. However, until recently this would not occur and those who wanted to use Mode S had to "push" their signals past the beacon using enormous amounts RF output power on 70cm. But with Peter's reprogramming of the Integrated Housekeeping Unit (IHU) to now turn off the beacon automatically, Bill McCaa (KORZ) reports that with normal Mode B uplink power levels it is now possible to bring down an excellent signal on the Mode S transponder. Bill points out that in his testing he had excellent signals using 300-500 watts EIRP using his own Mode B uplink capability. On the downlink his signals were 10 to 15 dB above the noise floor using a 4 foot diameter dish and 1 dB NF pre-amplifier. Bill would also like to remind OSCAR-13 users of the passband limits on the Mode S transponder. The uplink for Mode S extends from 435 471 MHz to 435 507 MHz. The corresponding downlink on Mod S starts at 2400 711 MHz to 2400 747 MHz. AMSAT salutes the efforts of all those who were involved in getting the Mode S transponder working properly. AMSAT encourages all OSCAR 13 users to take advantage of this new "resource"

MICROSAT News

The following is from AMSAT-NA Bulletin 232.02:

MICROSAT Lab Ground Test Station

Two Complete Ground Test Stations Installed at the MICROSAT Lab

On Sunday August 10, two complete PSK packet stations were installed in the AMSAT NA MICROSAT Lab located in Boulder, Colorado. The task of integrating the transceivers, computers, and building and testing the TAPR PSK demodulators, fell on the shoulders of AMSAT-NA Area Coordinator for Colorado, Jim White WDØE. These two complete stations will be used for testing the MICROSATs while they are in the Lab and also during thermal vacuum testing. Later, the two stations will be taken by the AMSAT-NA Launch Preparation Team to Kourou, French Guiana in October and will be used to check out the spacecraft and make any last minute software updates. Since four spacecraft are being built in parallel and because redundancy is needed at the launch site, Jim felt that it was necessary to have two complete stations.

The stations consist of a pair of 2m/70cm multi-mode Kenwood 711/811 transceivers, MFJ 1270 TNC 2, TAPR PSK modems, two XT class computers with monitors, and an assortment of "rubber duck" antennas, dummy loads, miscellaneous cabling, and power supplies. Also, Jim had to modify the TNCs to allow for a direct connection to the MICROSAT flight computers, so software uploading and testing can be accomplished without having to use the transceivers. Many of the visitors to the MICROSAT Lab in Boulder, Colorado are immediately impressed with the ground station assembled by Jim. After the launch, this equipment will be used by AMSAT ground-command stations to monitor telemetry and perform daily "housekeeping" chores.

AMSAT-NA would like to express its appreciation to Kenwood for donating their fine tran-

sceiver pair to the MICROSAT program. Thanks are also in order to Heathkit/Zenith Data Systems who donated a pair of the XT-class computers. Other equipment donations came from MFJ with their TNC-2's (MFJ-1270's), TAPR for the PSK demodulators, and an assortment of "odds and ends" from Gateway Electronics of Denver. Without these generous donations of essential equipment to the amateur satellite program, AMSAT-NA would have to focus its scarce resources to procuring this equipment instead of concentrating on building spacecraft. Once again, AMSAT-NA wants to acknowledge the excellent job Jim White has done in putting these stations together, and the many fine manufacturers who have helped to make the MICROSAT ground test/command stations possible.

To allow you to "see" the proposed orbit for UoSAT-D, these elements were taken from UO-11 Bulletin 196.

** UoSAT-D Elements **

Here is a provisional set for UoSAT-D at the point of injection into orbit as calculated by Craig G1WTW:

Satellite Name:	UoSAT-D
09/11/89 - 01:55:34 UTC	
Epoch Orbit Number:	1
Epoch Year:	1989
Epoch Time (Days):	313.080254463
Epoch RAN (Deg):	24.3439
Mean Motion (rev/day):	14.23617560
Epoch Arg.Per. (Deg):	167.3130
Mean Anomaly (Deg):	240.6300
Inclination (Deg):	98.7300
Eccentricity (0. 1):	0.001362
Semi-Major Axis (km):	7187.6900
Apogee Height (km):	826.4796
Beacon Freq. (MHz):	435.070
Perigee Height (km).	806.9004
Decay Rate (rv/day/day):	1.00000E-006

Vale Oscar 9?

At the time of writing, the fate of Oscar 9 was not known. Predictions earlier in the year had put the re-entry date close to its 6th birthday (October 6th). 73s from Maurie VK5EA.

Satellite Activity for May/June 1989

1. Launches

The following launching announcements have been received:

Int'l No.	Satellite	Date	Nation	Period min	Apg km	Prg km	Inc deg
1989-							
037A	COSMOS 2021	May 24	USSR	89.3	302	204	70.0
038A	RESURS-F	May 25	USSR	88.7	263	186	82.3
039A	COSMOS 2022	May 31	USSR	676.0	19158	19133	64.8
039B	COSMOS 2023	May 31	USSR	664.5	19140	19582	64.8
039C	COSMOS 2024	May 31	USSR	675.4	19155	19118	64.8
040A	COSMOS 2025	Jun 01	USSR	89.6	275	252	62.8
041A	SUPERBIRD A	Jun 05	Japan	1433.1	35831	35628	0.1
041B	DFS 1	Jun 05	Germany	1434.6	358.78	35646	0.2
042A	COSMOS 2026	Jun 07	USSR	104.8	1022	969	82.9
043A	MOLNIYA 3-35	Jun 08	USSR	12h17m	40696	631	62.9
044A	USA 38	Jun 10	USA	781.1	20276	20094	54.6
045A	COSMOS 2027	Jun 14	USSR	94.06	522	484	65.9
046A	USA 39	Jun 14	USA				
047A	COSMOS 2028	Jun 16	USSR	89.5	314	217	70.0
048A	RADUGA 1-1	Jun 21	USSR	24h32m	36538		1.5

2. Returns

During the period seventy four objects decayed including the following satellites:

1983-101A	COSMOS 1501	May 26
1989-031A	COSMOS 2018	Jun 19
1989-038A	RESURS-F	Jun 17
1989-040A	COSMOS 2025	Jun 15

3. Notes

1989-041A SUPERBIRD A and 1989-041B DFS 1 were launched by an ARIANE 4 rocket, version 44L, from Kourou Space Centre, French Guiana.

Bob Arnold VK3ZBB

Repeaters - addition, deletions, alterations. Have you advised the WIA Executive Office of changes to the repeater list?

New Brochures for the Amateur Radio Service

The Department of Transport and Communications has now produced three brochures to replace the old Amateur Operators Handbook - or the regulations book as it was commonly known. The first brochure numbered DOC 71 covering the Licence Conditions and Regulations applicable to the Amateur Service was released in March and reviewed in AR magazine.

It is recommended that every radio amateur, or prospective radio amateur obtain a copy of DOC 71 for it covers the regulations which govern the use of amateur stations, and its two companion brochures DOC 70 and DOC 72. The brochures are available from DOTC, and some WIA Divisions will also have limited stocks once they're available.

DOC 70 "Information for Prospective Amateur Operators", and DOC 72 "Amateur Service - Operating Procedures" are in the hands of the Government Printer and should be available soon. Copies have been made available to the WIA for review. DOC 70 is an introductory guide for those who wish to qualify and operate an amateur station.

It details the requirements for certificates of proficiency examinations, including exam devolvement which starts after February 1990, exemption from exams for persons who hold certain other qualifications, how to apply for a licence, and reciprocal and visitors' licences. The bulk of this brochure is appendices on qualification exemptions, a table of reciprocal licensing agreements, examination formats, and complete theory and telegraphy exam syllabuses.

DOC 72 outlines the operating procedures and practices for amateur stations. This includes calling procedures, identification of mobile or portable operation, distress and urgency communications and the obligation to accept distress traffic, notification of an appropriate authority on receipt of a distress message, the Q-code, a transmission emission designations, ITU phonetic alphabet, and callsign prefixes and suffixes. Whether you're already a radio amateur, or one studying for the regulations examination, you should read the three brochures which are available free.

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Satellite Activity for June/July 1989

1 Launches

The following launching announcements have been received:

Int'l No.	Satellite	Date	Nation	Period min	Apg km	Prg km	Inc deg
1989-							
049A	RESURS-F2	Jun 27	USSR	88.7	262	195	82.6
050A	NADEZHDA	Jul 04	USSR	104.9	1026	979	83.0
051A	COSMOS 2029	Jul 05	USSR	88.8	270	193	82.3
052A	GORIZONT 18	Jul 05	USSR	23h21m	35100		1.5
053A	OLYMPUS	Jul 12	Europe	1361.4	36113	33304	0.2
054A	COSMOS 2030	Jul 12	USSR	89.7	373	177	67.2
055A	RESURS-F3	Jul 18	USSR	88.6	253	195	82.6
056A	COSMOS 2031	Jul 18	USSR	89.0	283	200	50.5
057A	COSMOS 2032	Jul 20	USSR	88.8	275	193	82.3
058A	COSMOS 2033	Jul 24	USSR	92.3	436	410	65.0

2. Returns

During the period eighty five objects decayed, including the following satellites:

1984-015A	OHZORA	Jul 19
1989-036A	COSMOS 2020	Jul 15
1989-037A	COSMOS 2021	Jul 06
1989-047A	COSMOS 2028	Jul 06
1989-049A	RESERS-F2	Jul 11
1989-051A	COSMOS 2029	Jul 19

3. Notes

The following satellites are visible in Australia from time to time during a period prior to twilight during morning passes and after twilight during evening passes:

Designation	Name	Mag	Period
1964-063A	COSMOS 44	4	98.9
1965-096C	EXPLORER 31 Frag't	2	119.5
1967-104B	COSMOS 104 Rocket	4	96.7
1968-110B	OAO-A2 Rocket	4	99.7
1970-086B	COSMOS 372 Rocket	2	100.4
1972-065B	OAO-A3 Rocket	4	99.0
1975-072B	COS-B Rocket	3	126.3
1978-004B	COSMOS 975 Rocket	2	96.6
1978-056J	COSMOS 1013 Rocket	4	117.9
1978-064A	SEASET	4	100.4
1978-094B	COSMOS 1043 Rocket	4	96.2
1979-026B	COSMOS 1089 Rocket	4	104.7
1979-067B	COSMOS 1116 Rocket	4	96.1
1980-030A	COSMOS 1174	2	104.1
1982-033A	SALYUT 7	4	93.3
1982-116A	METEOR 2-9	3	101.9
1983-109A	METEOR 2-10	2	101.2
1984-072A	METEOR 2-11	4	104.1
1985-013A	METEOR 2-12	4	104.0
1985-100A	METEOR 3-1	4	109.4
1985-119A	METEOR 2-13	4	104.0
1986-017A	MIR	2	92.4
1986-061A	GEODE	4	115.7

de Bob VK3ZBB

Morseword No. 31

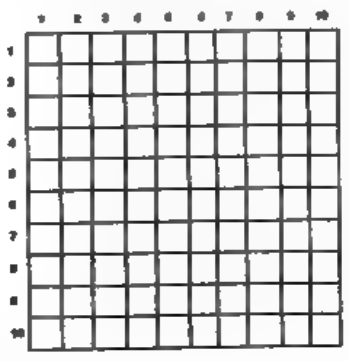
Clues

Across

1 Stalks
2 Part of the eye
3 Regretted
4 The actors
5 Wager
6 Dog's skin disease
7 Be ready for
8 Chinese sauce
9 Poke
10 Twist

Down

1 Huge
2 Forgery
3 Scene
4 Animal park
5 Former Hindu practice
6 Part of speech
7 Sound of decision
8 Small boy
9 Spoken
10 T-bone for example



Solutions page 52

60 Years Ham Radio Licenses in The Netherlands

In August 1989, it is precisely 60 years ago that the first exams took place in The Netherlands, and the first licence was issued to PAØBZ.

To honour this event, the Dutch amateur organisation, VERON member of the IARU region 1, decided to draw world wide attention to this fact.

Thanks to they co-operation of the Dutch PTT administration, they managed to obtain a special prefix for a period of 60 days, starting on 1 October, and ending on 29 November 1989.

The special prefixes will be:

PAØ becomes:	PA6Ø
PA1 becomes:	PA61
PA2 becomes:	PA62
PA3 becomes:	PA63
PA6 becomes:	PA66
PI4 becomes:	PI64
PBØ becomes:	PB6Ø
PDØ becomes:	PD6Ø
PEØ becomes:	PE6Ø
PE1 becomes:	PE61

Another reason for choosing this time is that a number of contests will take place during this period of 60 days. These are:

October 7/8:	IARU/VERON contest VHF/UHF/SHF
October 15:	VERON Autumn contest
October 28/29:	CQ-WW contest, (SSB)
November 4/5:	IARU/VERON VHF/UHF/SHF - CW
November 11/12:	VERON-PA-cup contest
November 25/26:	CQ-WW contest CW

To stimulate the radio amateurs all over the world to take part in this event, VERON will issue a special Certificate, which can be obtained by **all** radio amateurs, including SWLs.

The rules to receive this certificate are as follows:

a) It includes all bands, HF-VHF-UHF-SHF and modes
   Dutch stations: 60 special prefixes
   European stations: 30 special prefixes
   DX-stations: 15 special prefixes
   SWL stations: On the basis of "heard"
b) The "Standard" certificate is for mixed modes, regardless of the band on which the QSO has been made
c) Special endorsement for:
   Only HF
   Only VHF/UHF/SHF
   Only CW
   Only SSB
   Only SWL
d) QSL cards are not demanded. An extract from your log is sufficient, signed by two other radio amateurs. Send to PAØBN, through the normal QSL channels. The closing date for demanding your certificate is 31 March 1990
e) As an additional feature, the HF Traffic section of VERON will start, in this same period, a "promoting" action on the "WARC-bands"

ar

INTRUDER WATCH

Call to Action!

Gordon Loveday VK4KAL
Federal Intruder Watch Co-ordinator
"Aviemore" Rubyvale 4702

The cooler weather has not been kind to observers "braving" their cold shacks during July. Some fall-off in logs has been the result in all states. The station operating on 14.048 MHz is causing a lot of interference with its 24 hour telephone traffic. It can be partly resolved, if one is prepared to swap side-bands and modes - it is definitely NOT amateur. Information required is call-sign or other ID and bearing - some text would be handy.

Daylight saving in other states may bring better condx on 80mx. the IW net is held each Friday on 3595 +/- QRM at 0700 UTC - call in if free.

I ask ALL amateurs to just think for a few minutes, of what their hobby is going to be like, when our bands are over-run by illegal operators . . . yest I said "when" - because as sure as the sun rises each day, that is the inevitable end of amateur radio, UNLESS WE get off our backside and populate the bands, as we do at Contest time.

Report ALL intrusions by illegal users, don't just complain to the person you are in contact with. as I've often heard. Your IW Co-ord is the person who wants to hear about it, so send him a log or to me.

Let me make it clear, it will make NO difference what mode of operation we follow, even as I write Governments and others are considering the buying of band space; THIS WE JUST CANNOT ALLOW IN REGION 3. Don't let the ITALIAN experience of 40mx have any place in our Radio Spectrum. Look to the FUTURE and don't be COMPLACENT about the PRESENT. LET'S HAVE ACTION NOW. DOTC will not act on our behalf if WE DON'T supply them with information - POSITIVE INFO. If you come across carriers sit with them as they OFTEN give a callsign, and that is what we want. REMEMBER, frequencies, modes are of little use WITHOUT their "finger print" . their call-sign.

(Remember never move for an intruder.)

Logs were received in July from following VKs 2PS, 3IS, 3XB, 4AKX, 4ANL, 4BHJ, 4BTW, 4BXC, 4MWZ, 5GZ, 5TL, 6RO, 6XW and 8JF.

CB'ers from Asia and Indonesia were reported from all states in ever increasing numbers. ar

Summary of Intruders for July 1989

Freq.	Mode	Date Time	UTC	III	Comments
7001	F1a	6/7	1050+		FM Morse, odd letters, short groups
7004.6	A1a	28/6	1148	—	
7020	NØN	28/6	1149	—	Strong carrier no audio
7023.5	R7b	11/7	1020+	—	Continuous
7035	R7b	25/7	0920	--	
7080	A3e	24/7	0900		Radio Bangladesh
				B'desh	Radio Bangladesh Broadcaster
14000	PØN	mni	mni	-	Woodpecker
	NØN	mni	mni	}-	0700/1300 hrs breaks to USB & French voices
14001.5	B9w	25/6	0930		
14002	NØN	16/6	1139		
14003/5	F1b	17/6	1050+	ULH	Hi speed RTTY
14008	NØN	14/7	1115	-	Continuous carrier S7
14016.5	B9w	28/6	1105	-	Continuous DIT
14023.5	B9w	mni	mni	UMS	Also F1b. USSR Naval/3rd Cyrillic shift
14024	F1b	Dly	mni	-	135deg RTTY cont 400hz sh/dly since 1987
14046.5	F1b	mni	mni	-	RTTY pos 3rd Cyr sh USSR/dif resolve
14048	NØN	mni	mni	-	Uses NØN when No traffic
14048+	A3e	mni	mni	-	Radio telephone female operator
14049	A1a	11/7	0635/50	PKJ	CPQ de PKJ zan QRX next VA
14049.5	F1b	11/7	0900+	-	RTTY poss 3rd Cyrillic shift reg user
14056/7	A2a	21/7	1037	KHACHS	Possibly callsign???
14070	A1a	04/7	1030+	VBX	VPO de VBX 5 figure traffic
1407/5	A1a	mni	mni	VRQ	Bearing 350 Albany +/- 5 kHz wide
14075.5	A1a	16/7	1330	VCN	5 letter groups
14075.1	A1a	9/5+	1203	EURQ	Cq de EURQ QTC 70 CPU
14076	A1a	mni	0700/10	VPC	BFQ de VPC QSV K R MSG? QTC ZNN
14080	NØN	09/7	0410	-	Continuous - no ID S9
	A1a	4/7	0130/33	KFB	CQ de KFB AS DKA QSV K RXQ - traffic out
14085	A1a	9/7	1027/35	NPO	CPQ de NPO HR zan PSE QSY A3
14095	A1a	15/7	0100+	KPO	CQ de KPO QSV K AS - traffic out
14100	A1a	01/7	0932/3	NZB	ZBK de NZB QSV R 474 CY RU/ 318 AR
14101	B9w	16/7	0930	-	
14111	FSK	30/6	1110+	-	BT 508023, letter & figure groups
14114	F1b	24/6	mni	-	Letter & figure groups
14121	3x B9w	mni	mni	-	
1424/6	F1b	mni	mni	-	A3C & F1b Signals on same frequency
14130.7	A3e	28/6	1157	-	Foreign broacaster male announcer
14140.5	F1b	mni	mni	UMS	RTTY 3rd shift register USSR
14141	A1a	mni	0403/25	UPC8	UN R70 de UPC8 QSV K traffic out
14143/6	2x R7b	5/7	1120	-	
14159.5	FSK,F1b	17/7	0300	-	Traffic
14170.5	A1a,F1b	mni	mni	UMS	Also 14171mhz/5 fig groups, RTTY Z code zan
14172.45	A1a		0550	76VC	Bearing 140 deg cld KRW de 76CV
14186	A1a	30/6	0915/45	FR2R??	FR2R. Also on RTTY taking traffic
14187	R7b	mni	0245	-	
14200	A1a	10/7	0905+	VMO	VLQ de VMO QSV KRQA Traffic out
14215	A1a	4/7	1000+	RX3	R2V de RX3 Traffic out
14216/7	NØN	mni	0518+	-	
14242	F1a	20/7	0950+	-	FSK 3kHz Letters & Figures "K" occurring
14244	mxd	mni	0530+	-	R1b,A3c,A1a used "QSA" repeated, also NØN
2100/2	NØN	mni	mni	-	Various. Mars net/French in Pacific, spill over from 20999kHz
21022	A1a	29/6	0600	F	F beacon, norm on 29 995 mhz
21032	F1b	20/7	1205	???	Possibly UMS (more listening needed)
21115	A1a	mni	mni	CQ5	CQ de CQ5 QRU
21215	J3E?	2/8	0614+	-	Russian plain language groups of 5 letters
21246	A1a	22/7	0625+	GVS	Only call given QSY 16420 QSA
21250	R7b	mni	mni	-	4-6 kHz wide
21320.5	"x2"	16/7	1152	-	
21328	A1a	19/7	530/540	ZNH	1PD de ZNH or ZNV? QSA? QSV
21350.5	2x B9w	26/6	0855	-	Possibly 3rd shift reg not confirmed
21355.5	F1cw	11/7	0750	-	Freq mxd cypher Russian text, no ID
21370	A1a	mni	0600/07	R99,X5N	Group using irregular C/S traffic
Late observations as follows:					
21060	A1a	21/6	0505+	ADL	RMD de ADL HW/ADL de RMD QRK?
21317	A1a	22/7	0644+	-	News items/already sending traffic when heard
28560	A3e	mni	mni	-	Broadcast station 340 deg VK6RO
28575	A3e	mni	mni	-	Broacaster bearing 360 deg VK6RO
28919	A3e	21/5	0701	-	Radio Beijing Chinese anthem & news

EDUCATION NOTES

Devolvement Update

Brenda Edmonds VK3KT
Federal Education Officer
12 Pinewood Drive
Mt Waverley 3149

Those members who responded to the original devolvement package and expressed interest in becoming examiners should by now have received the latest handout from DOTC. This comprised the revised Novice question bank, both in printed form and on diskette, with instructions, a final copy of "DOC71" and drafts of "DOCs 70 and 72". Most of the amendments requested by our Working Party have been incorporated into the bank, and the diagrams have been greatly improved.

We have been advised that the next mailing will probably be the instructions for preparation and conduct of examinations. The AOCP bank will follow as soon as possible, but the "examination generation" program will be a while yet. Several interested members are working on program development, and I am sure DOTC will be happy to accept their co-operation.

The Examinations Officer has requested that we refrain from submitting papers for accreditation for a little longer - until all the resource material has been finalised - as he is the only one working on the devolvement and that only for part of his time. The current situation is still that DOTC will run the November and February exams, and after that will only examine in special cases.

I am concerned that some of the comments reaching me indicate that some amateurs are still unaware of the facts behind the devolvement. It is many years since the WIA first raised with DOTC the possibility of examinations by other bodies. At that time, our concern was to provide a better service to candidates by making exams available more often or more conveniently. Many schemes were proposed at various times by DOTC, the WIA and others. The eventual triggering factor was the move towards cost efficiency and the "user pays" system which would have raised examination fees to a totally unacceptable level. At that stage, DOTC had recently devolved the responsibility for both Broadcast Operators and Maritime licences, so the amateurs were about all that was left. When we saw that devolvement was inevitable, we urged that the Department retain control by continuing to produce the actual examination materials, leaving only the administration of the exams to external bodies. This suggestion, however, was not accepted.

There has not at any time been any move by the WIA to use the devolvement to lower the entry standard to the hobby, and it is not anticipated that any lowering will in fact occur. The present Novice standard is such that most candidates can pass fairly easily if they are prepared to make the effort. In recent examinations, the pass rate has several times exceed 50 percent. In our evaluation of the question banks, the standard we had in mind for the Novice level was that of enthusiastic Year 9 student, say 14-15 years.

The suggestion has been made that once the question banks are released it will only be necessary to learn the answers. Thee will of course, always be some who try for short cuts, but for most people, rote learning of 500 (or 1000 for AOCP) questions would be a fairly painful way of ensuring a pass. It would inevitably cause the candidate to learn a considerable amount of radio theory in the process. (It cannot be assumed that the alternatives will be presented in the same order on all papers, so there will not be any point in learning "Q 1 51, answer d, Q 1 52, answer c, etc.)

What we will be achieving from the devolvement will be that which we sought when the ideas were first raised - the improved service to prospective amateurs which will come from the possibility of the exams going to the candidates, at a time to suit them, under less threatening or uncomfortable conditions than some of us have experienced. Under these less stressful conditions the pass rates may well rise. As I have said previously, we hope that all examiners will maintain adequate records and be prepared to share information so that the best possible system can be developed.

Thank you to all those who sent their good wishes for my relocation. The move has been completed and all systems are now operational except the HF. My new address will be in the new Call Book.

ar

EMC REPORT

EMC - Problems Worldwide

Hans F Ruckert VK2AOU
EMC Reporter
25 Berrille Road
Beverley Hills 2209

1 : It has been reported from West Germany . . .

that a fighter plane crashed without its pilot being on board. The pilot did a low level training flight. When he turned on the contour-following radar, some stray rf got into the ejector seat circuit and triggered the ejection of the seat with the pilot. This was a costly EMC mishap. It is not surprising that the "University of the Wehrmacht (Bundeswehr)", near Munich, conducts a lot of EMC research. EMC problems on ships of any navy are also very serious, and often difficult to solve.

2 : A Welcome EMC Lesson from South Korea

DL1BU (hon Technical Officer of the DARC) reports that the recently established TV manufacturer Goldmark of South Korea offers the best colour TV set as far as the EMC Cell Test is concerned. The Jacky test with 50 V/m field strength did not affect this TV receiver over a very wide frequency range. The DARC did ask for a test with 10 V/m, whilst the FTZ (=DOC) demanded 3 V/m, and the Common Market experts want only about 2 V/m. Conventional manufacturers fight for every volt of field strength, claiming that it costs too much to be any better. We can only hope that they obtain Goldmark sets to learn how excellent EMC has been achieved, and at very low cost too. The model CBS 441, without remote control, costs DM350 (about $241), screen size 36cm. The TV set CBT-4442 with remote control costs about

DM450 (about $310). DL1BU will continue the Jacky tests with even higher field strength to determine the limit. He recommends that the Post Office (FTZ Radio Inspectors) use these TVs to demonstrate to owners of other TV types the low immunity of their set, compared to a correctly designed receiver. Add-on EMC improvements are only an emergency method. Experts have always stated that EMC capability has to be achieved at the design stage of electronic equipment. DL1BU is preparing a more detailed report.

3 : Instant TVI

The writer wished to improve the signal strength of the Channel 28 station. A preamplifier type Arista made in Taiwan was obtained. This very small amplifier does, as promised, amplify every rf signal - wanted as well as unwanted types - from 5 to 900 MHz. Having no selectivity whatsoever, overloading of the TV front end stage must occur, if a relatively strong rf signal is picked up by the TV antenna, even when the unwanted legal signal is many MHz away from the wanted TV channel. This is the reason why this type of preamplifier is illegal in West Germany. There, the Radio Inspector has to check all masthead preamplifier installations to see that the equipment has adequate selectivity, and contains rf filters to pass and amplify only TV channel signals. With the Arista unit installed, the TV set showed on all channels only 3-4 cm wide black and white horizontal bars as soon as I operated my transmitter on 14.3 MHz. The interference stopped after placing a highpass filter (see AR December 1987, page 50) between the antenna feeder and the preamplifier. Amplifiers of this type (any make or model) should only be used with an effective highpass filter to avoid EMC problems. Several manufacturers in DL produce amplifiers, which contain the necessary tuned circuits forming highpass filters.

4 : The Garage Door Mystery

QST Reports. A neighbour of a radio amateur was puzzled when he noticed that his garage door opened at odd times without him operating the electronic remote control. The radio amateur next door, who had heard about similar cases, offered to investigate and help. He found that the supply cable to the opener acted as an antenna when he was transmitting, and doing what was supposed to be done with the remote control of the garage owner. A small bypass capacitor of 125pF, across the switch contacts at the garage, solved the problem. The radio amateur informed the manufacturer who was grateful for the hint, now intends to put a capacitor in every new unit.

5 : Heavy Duty Trucks and Amateur Radio

General Motors USA asks radio amateurs who operate heavy trucks etc to write to them describing the frequency bands, power level and antenna locations of their gear installed in the trucks. The letters may be sent to the EMC department. How about trucks in Australia?

6 : Interference from TV Line-Frequency Generators

Whilst the stray field from these generators usually peters out at 3m distance, when one tests with a receiver tuned to the 14 MHz band, not all TV sets sold in USA or Australia behave so well. A mains line-filter with the case grounded and antenna highpass filter is needed in some cases. The harmonics from these generators can, in some very bad cases be heard all about the house from any radio receiver. If the affected radio amateur complains to the manufacturer of the TV set, he may not even get a reply, or he is told that all TV sets do the same, which is not true at all. In cases where the TV set and HiFi-Radio are installed in close proximity interfering generator harmonics will only disappear if radio is tuned to a strong station, when the agc action reduces the radio's sensitivity and gain.

7 : TV Signal Strength and Immunity

Better immunity against unwanted signals can sometimes be obtained by removing baluns and splitters, accepting any mismatch, when the balun and/or splitter is causing too much signal strength loss.

8 : EMC (RFI) Problem Reporting Forms

The ARRL, as well as the DARC, have now EMC-Problem Report forms available for their members. The reporting, in a standard form, makes it easier for EMC-Committees and radio inspectors to judge the case prior to visiting the location. The evaluation and computer compilation of the reports can be used in discussions with manufacturers. They can also help the defendant in court cases.

9 : Ralph Cameron, VE3BBM writes . . .

"You may be aware that the appliance dealers in Canada have complained that for many years they could not adopt immunity standards because they wanted to "harmonize" with the USA. It is somewhat significant that European Economic Community have been dissatisfied with the progress made by CISPR, and so have decided to implement immunity standards beginning in 1991-92. Many Canadian manufacturers are apprehensive, because they now will have to adopt some standards in order to comply with a European standard if they wish to sell their electronic equipment there."

10 : Video Recorder and EMC

DJ1ZB describes in CQ-DL 6/1989 how he managed to solve the susceptibility of his VCR. Mains line chokes with ferrite rings and similar chokes for the other cables could only improve the unwanted susceptibility. Only 2 watt output on 80m, 40m and even 10m was enough for the VCR to turn itself off. The last resort was - as recommended by DL1BU - to construct a metal case which closes all sides of the VCR except the front. The cable braid has contact with the aluminium box. The lesson learned: Don't buy a VCR which has no internal or external shielding.

11: Using the Right Name

There are still many people, including some who should know better, who mix up the term Citizen-Radio and Amateur-Radio. It is even more important to teach the public the difference between "interference" and "disturbance (lack of selectivity or too much susceptibility)". Interference can only be caused by an illegal transmitter transmitting on the allotted frequency of a legal transmitter. Disturbance is caused by design deficiencies of an appliance, resulting in susceptibility of unwanted signals which are not transmitted on the operating frequency or channel used by the appliance. Disturbances can also be caused by susceptibility of electronic equipment which should never receive signals from legal transmitters, or be affected by them. By using the technically correct term, we state clearly who is responsible for an undesirable situation. This is vital if the legal profession wishes to administer justice. ar

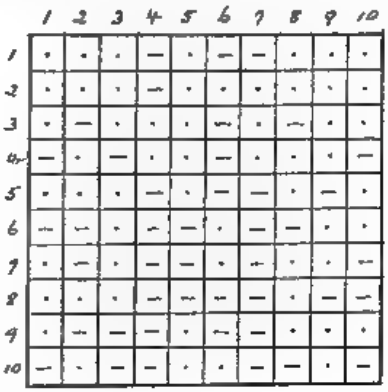
Solution to Morseword No. 31

Across:

1 stems;
2 iris;
3 rued;
4 cast;
5 stake;
6 mange;
7 await;
8 soy;
9 jab;
10 tweak

Down:

1 vast;
2 fake;
3 view;
4 zoo;
5 suttee;
6 noun;
7 boo;
8 inlet;
9 said;
10 steak



Contest and More

Joy Collis VK2EBX
PO Box 22
Yeoval 2868

ALARA Contest

The ALARA Contest is fast approaching, and hopefully with improving propagation there will be a high level of participation this year

Date: 11 November 1989
Time: 0002 UTC to 2359 UTC

(As the contest falls on Armistice Day this year, two minutes silence to be observed at the start as a mark of respect.)

All licensed operators throughout the world are invited to participate, also SWLs.

Hope you can join us for an enjoyable 24 hours.

Florence McKenzie CW Trophy

This prestigious Trophy is awarded annually to the novice YL operator (not necessarily an ALARA member) with the highest CW score in the Contest. Minimum score - 50 points.

Response in 1988 to this integral part of the Contest was disappointing, but as all points are doubled for CW contacts, only five ALARA members, seven YL non-members or nine OM contacts (or a mixture) are required to qualify - not an impossible task.

Novice/Limited operators ("J" and "K" calls) are eligible to compete for this trophy, a fact which may not be generally realised.

Well, how about it his year? You don't have to be a CW "whizz kid" to enter, and even if the CW is a little bit rusty and slow, you will still get plenty of encouragement. Trying it is the only way to improve and gain confidence, and maybe win this Trophy!

(The actual Trophy, because of size and weight, is not sent to the successful contestant. It is housed on display at the Burley Griffin Building, headquarters of the SA Division of the WIA. An attractive certificate bearing a photograph of the Trophy is sent to the winner instead.)

DX-YL News

Forthcoming YLRL Contests

YL Anniversary Contest:
CW: 11/10/89 - 1400 UTC to 13/10/89 - 0200 UTC
SSB: 25/10/89 - 1400 UTC to 27/0/89 - 0200 UTC
Logs: Must be POSTMARKED by November 10 1989 and RECEIVED by December 1 1989.

Looking Ahead

YL-OM Contest:
Phone: 10/2/90 - 1400 UTC to 12/2/90 - 0200 UTC
CW 24/2/90 - 1400 UTC to 26/2/90 - 0200 UTC

East Meets West SSB Contest:
17 March 1990 - 1600 to 2200 UTC

DX-YL to North American YL Contest:
CW: 11/4/90 - 1400 UTC to 13/4/90 - 0200 UTC
SSB. 18/4/90 - 1400 UTC to 20/4/90 - 0200 UTC

BYLARA celebrated their 10th Anniversary this year, the highlight of the festivities being a Rally at Drayton Manor Park (Staffordshire) on 14 May

Members attended from all parts of the United Kingdom, and greetings were received from DX-YL organisations. The day was fine, and a good time was had by all, with plenty of food, including a magnificent birthday cake provided by Margaret GW4SUE. Plenty of photographs were taken, and it is hoped to produce a souvenir booklet later in the year as a memento of a very happy occasion.

WARO now have a Certificate of Merit which will be presented this year for the first time, and will provide a means of official recognition for many and varied deserving activities.

The first recipients are Ruth ZL3PL for long service as South Island representative and net controller over a period of 12 years, and Anne ZL3VR for their efforts in fostering interest in amateur radio, especially among ZL3 area YLs.

Here and There

The VK3 Birthday Luncheon held at the home of Ray and Raedie Fowler on 30 July proved most enjoyable. Nine YL members and four OMs attended. There was plenty of stimulating conversation, and presents were exchanged. Ray proved an ever helpful host, and a very pleasant time was had by all.

Margaret VK3MCZ was the prime organiser of a luncheon to celebrate the 10th Anniversary of the Southern Peninsula Amateur Radio Club in August. The club has only two YL members, the other being Bron VK3DYF, (ALARA Newsletter Editor)

Congratulations to Carol VK8NCA, recently appointed President of the Darwin Amateur Radio Club

Nancy VK2NPG called in on the ALARA Net in August after a long absence. She and OM Dale are now on a round-Australia trip

Wendy VK4BSQ, OM and family, who have been sailing the Pacific, are in Japan at the time of writing. Wendy attended the JLRS Conference on 29 July

Congratulations to Vicki VK5FK on the birth of a daughter

Congratulations also to Val VK4VR who became a proud grandmother for the first time.

There has been a good response so far to the ALARAMEET survey form circulated among members recently. Hopefully Dubbo will prove a popular venue for the 1990 get-together.

Don't forget - JOTA, 21/22nd October. An opportunity to introduce amateur radio to some of our young people, and assist in a very worthwhile activity.

YL Nets

In reply to enquiries received:

The official ALARA Net is held Mondays at 10.30 UTC (1000 UTC during daylight saving time) on 3 580 +/- QRM.

YL Activity Day is held 6th of each month. Listen on the hour UTC.

Frequencies.

Phone: 3 588; 14.288; 21.188; 21.388; 28.588; 28.688.

CW: 3.530, 14.058, 21.058; 21 133, 28.088; 29.133

YL "222" DX Net: Mondays 0600 UTC, 14.222.

Queensland Net: Tuesdays 0930 UTC, 3 570 +/- QRM

VK6 ALARA/YL Net. Mondays 1200 UTC, 3 580 (After the official ALARA Net)

VE/VK/ZL Net: Fridays 0500 UTC, 14.148.

Silent Key

It is with regret that we announce the passing of Joan VK3NLO in late August. Our sympathy to her family and friends

New Members

A warm welcome to

Coral VK8NCH and Diane ZS5DC who have recently joined us

That's it for this month,

73/33

ar

Remember to leave a three second break between overs when using a repeater.

DIVISIONAL NOTES

VK2 Notes

October Activities

Early in the month, closing date for agenda items for next Conference of Clubs. It will be hosted by the Central Coast on Saturday 11 November. JOTA weekend 21/22 October. The JOTA committee will be including details on the broadcasts. Towards the end of the month it is expected that the VK2RWI 23 cm repeater will be commissioned. The equipment was a donation from Dick Smith Electronics. Listen to the VK2WI broadcasts for details and dates. The Wagga ARC Field Day, first weekend in November. WICEN (NSW) Inc will be taking part in the annual Hawkesbury Canoe Classic over the weekend 14/15 October. If you are able to assist, advise the office during the normal times, 11 am to 2 pm Monday to Friday on (02) 699 2417 or Wednesday 7 pm to 9 pm. Other WICEN information or membership applications may also be obtained from the office.

A reminder that times and frequencies of the two Sunday broadcasts from the VK2 Division may be found on page 3 in the WIA Directory. Both broadcasts are proceeded by a 1/2 hour technical segment. If you miss the news times then headlines may be obtained by phone on (02) 651 1489. Much of the broadcast text is available on the Division's BBS, VK2RWI on 4850 and in turn relayed to other BBS's.

Council Club Visits

A visit was made to the Central West at the invitation of the Orange ARC on Saturday 22 July. Affiliated Clubs Officer, Reg VK2AI has been in touch with most of the clubs via his monthly posting and other visits are being arranged.

Satellite Seminar

This most successful weekend last May was sponsored and funded by the NSW Division. Graham VK5AGR, National Co-ordinator for AMSAT - Australia, presented three sessions. These were video taped and there is about 8 hours available in the VHS format. Affiliated clubs and members may borrow these tapes. Contacts the office for details and bookings. Graham supplied a set of notes for the Seminar. The Division photocopied the notes for those who attended. Arrangements are now being made to print off a further run. There are 126 pages. These will be available from the Divisional Bookshop at $15 posted.

New Members

The following joined the NSW Division during July

D A Brogan	Assoc	Adamstown Heights
B A Carter	Assoc	Melbourne
W D Chadwick	VK2XWC	St Clair
J D Coffey	Assoc	Wellington
J B Dodds	Assoc	Marsfield
I J Forbes-Smith	VK2NFS	Northbridge
D N Harding	VK2DUR	Macksville
D J Hawksworth	VK2BDJ	Vincentia
J K Jackson	VK2FYD	Emu Heights
G Kaster	Assoc	Marayong
B R Lesslie	VK2MHD	Springwood
P J Perry	Assoc	Werris Creek
K W Purves	Assoc	Richmond
J B Scott	VK2FSP	Picton
J Sigley	VK2FSJ	Canaba
S P Truscott	Assoc	Elermore Vale

During August, the following new members joined the VK2 Division:

E R Babicca	Assoc	Ashfield
D J Bloodworth	Assoc	Turramurra
R W Boyd	VK2KLC	Rooty Hill
K E J Burridge	Assoc	Padstow
J C Cowell	Assoc	Mt Prichard
M Cvetanovski	VK2EAN	Shortland
J W Daniel	VK2BKZ	Rooty Hill
W J Dowling	VK2DEF	Kingswood
L M Doyle	VK2VOE	Wiley Park
C S Ferguson	VK2ZR	Maroubra
C G Gardiner	Assoc	Dundas
C Hall	VK2FDX	Bellevue Hill
N B Hough	Assoc	Potts Point
B P Mills	Assoc	West Pennant Hills
A W H Poon	Assoc	Castle Hill
M G Willis	Assoc	Eagle Vale

The following joined the NSW Division during September:

H G Braak	Assoc	Lavington
R J Duck	Assoc	Tamworth
R A Fitzgerald	VK2FRX	Bateau Bay
A T Grimm (Ms)	VK2MHJ	Wollstonecraft
J P Kelly	Assoc	Bourke
W J Lawrence	Assoc	Singleton Heights
J A MacCallum	VK2PVN	Merrylands
E O Mahoney	Assoc	Auburn
T P Mortlock	Assoc	Bidwell
B R Rochfort	Assoc	Maclean
R PSidney	Assoc	Yagoona
A B Stewart	VK2EJR	Bega
P W Turner	VK2XPU	Kingsgrove
H V J Virtanen	VK2FNK	Lightning Ridge
P J Wait	VK2DKN	Artarmon
T R Walmsley	VK2FKH	Merrylands
P W Woof	VK2FWI	Killara

A warm welcome is extended to the above recent new members of the NSW Division.

VK3 Notes

Members are notified that a General Meeting of the Wireless Institute of Australia (Victorian Division) will be held at 8pm on Thursday, October 26, 1989, at the Combined Clubrooms located in the Turner Road Reserve, Turner Road, Highett, Victoria.

AGENDA ITEMS are as follows.

1 Report by Council on the current financial status of the Division, and the effect of the increase in the Federal component of the annual subscription for 1990.
2. To set the Divisional component of the annual subscription for 1990 in accord with Article 43 of the Articles of Association.
3 To discuss the operation of the new Inwards QSL Bureau.
4. General Business (time permitting).

The meeting will close not later than 10.30 pm.

Barry Wilton
Secretary

(Please note new phone number for VK3 on page 3 - Ed.)

"5/8 Wave"

Photographs of Past Presidents

One of the sad ironies of Brian Austin VK5CA's untimely death, was that in the previous week he had given me a photo of himself (at the time he as President of the Division) to put on the wall in the BGB. I am pleased to say that by the time you are reading this, he should join the photographs of Tom Laidler VK5TL, Phil Williams VK5NN and Warwick "Pansy" Parsons VK5PS, hopefully all framed and on display. I must thank Geoff Taylor VK5TY for donating the lovely photo of "Pansy", and please, keep looking for those suitable photos of yourself, or someone else during the years as President.

News From VK8

Greetings to all our friends in the Top End & the Red Centre. Its good to pass on some news from the Darwin ARC, this month. They have had a change of Committee and are pleased to announce the following.

President: Coral Haworth VK8NCH
Vice President: Bill "Spud" Murphy VK8ZWM
Treasurer: Graham Anderson
Secretary: Henry Newland VK8HN
Station Manger: Trevor Hine VK8TA

Congratulations to you all, and I hope you'll keep us advised of any happenings, up there (the '8' in "5/8 Wave" does stand for NT you know!)

Clubs Convention

By now, your Club Secretary should have received Minutes of last year's Convention, and information on next year's which will be held at Ridgehaven Primary School, from 16 to 18 March 1990. Please start thinking about your Agenda Items NOW!

Diary Dates

Tuesday 24 October General Meeting 7.45 p.m.

Tuesday 31 October Buy and Sell Night 7.30 p.m.

Jennifer Warrington
VK5ANW

VK6 Notes

Fees

VK6 Council have set next year's WIA fees at $56.00. Rates for other grades of membership will be announced in the near future. This is a considerable saving on the $70.00 plus talked about on air, often by non-members. The increase seems reasonable for the services available. However, should you have reason to complain, contact one of your council and discuss the matter - its the best way to resolve any complaint.

Morse Workshop

Congratulations to all students who passed the recent morse test, and have realised their ambition to become a radio amateur. Many owe their success to the morse workshop run by Mal VK6LC and a dedicated group of helpers. The methods employed by the workshop, have now turned many who thought they couldn't do it into success stories, and has a lot of merit. No doubt, some of the students will, in turn, offer Mal some help in the future, and perpetuate the workshop idea.

Events NCRG

"Hamfest 89" is on October 8th, and it may be too late for you to attend this year. If you missed out, why not visit the Hills Amateur Radio Group at Kalamunda Festival on October 28th their display will be directed to the general public as a PR exercise for AR. Why not take the family and meet the group in person. The Peel Radio Group at Mandurah have been running practice sessions for JOTA. No doubt this has been a great help to the boys and girls and should help them get more out of the exercise.

QSL Bureau

Jim VK6RU reports that many cards remain uncollected and are causing him a few problems. Do you bit and collect them before the writing fades, or send a SAE and they will be sent by post. Some clubs act as QSL agents. If there is one near you, a club could be a convenient send-and-receive point. Check it out.

Indians

Very little news filters through from the country. However, there is a rumour that a "Pow Wow" is being set up in the South West. Let's hope more fuel is put on the fire before it goes out. We are certainly looking for the smoke signals here in Perth.

John Howlett
VK6ATA

SPOTLIGHT ON SWLING

Changing Audience Patterns

Robin L Harwood VK7RH
52 Connaught Crescent
West Launceston 7250

Well, the season has changed and there already has been a marked change in patterns. Now, as the days lengthen, I am finding that propagation is staying in later in the evenings, with the higher frequencies staying in later. There has been an interesting prediction that the Maxima of Cycle 22 will be between August and December, yet as this is only determined retrospectively by the Brussels Observatory, we will probably not know until six months after it has happened.

In the winter months I was very surprised to see how the 21 MHz amateur and broadcasting allocations came alive during the daylight hours. I was pleased to work many Europeans around our local midday on SSB, receiving respectable reports, despite my modest set-up. I expect that I will be able to work many more during the late evening hours over summer. Yet I have been disappointed that many broadcasters have deliberately chosen to ignore the 11 meter allocation between 25600 and 26100 kHz. Deutsche Welle pointed out that many of the portable receivers that cater for the vast audiences in the developing areas of the world don't have this allocation fitted, and because of the economics of power versus audience size, it is rational that they concentrate on where the majority of the audience listens.

It does make me think that exactly 50 years ago, during the Second World War, the majority of the shortwave audience was in Europe and North America, while today the audience profile is predominantly from Africa and Asia, where TV is not so prevalent. However, broadcasting organisations have found that their mail from Eastern Europe and the USSR, in particular, has increased by 300% since "Glasnost". DX clubs are springing up throughout that vast nation, particularly in the Baltic region and around Moscow. The demise of jammers has made it much easier to receive western broadcasters, and mail restrictions have also been abolished.

Although this openness has, in itself, exacerbated regional and ethnic rivalries, and Soviet authorities claim that western broadcasters are inflaming the delicate situation, - yet, I don't believe that jamming will be re-introduced. Only China and Iraq are the nations that do employ jamming of foreign broadcasts.

It has been reported in Japan that a "pro-Democracy" station, broadcasting in Chinese, has been heard on 7 125 kHz from 0945 UTC with a 15 minute programme that is repeated at irregular intervals throughout the day. Location is supposedly in Taiwan. I cannot confirm it, but I do know that there was on station on 15 0837 in Chinese at 1030 UTC which was behaving suspiciously and could be this station. The 7 MHz frequency is too close to both Radio Australia in Chinese and another Taiwan station - "the Voice of Free China". This clandestine operation would hop around the allocations, presumably getting close to a domestic Chinese shortwave frequency and hope to accidentally attract audiences.

The Australian Time and Frequency Station, VNG in Llandilo NSW, continues on 10 and 15 MHz with their experimental transmissions while 4 MHz is on continuously. Ten and 15 MHz are on between 2000 and 0700 UTC, that is during local daylight hours. NZ users of WWV and WWVH have complained that VNG is blocking out voice announcements. The RAN Time and Frequency Station is continuing on 6448 and 12882 kHz but has been relocated to the Northern Territory to service tropical areas and the Indian Ocean. I do expect that once VNG is permanently operational, that this temporary facility could cease.

In conclusion, if you are looking for an African catch, try 4904.7 where there is a station broadcasting in French. The station is in Nd-jamena, Chad and had disco music around 2145. Signal strength was reasonable. Another DX session can be heard at good levels. It is "DX Asiawave" and is compiled by Bob Padula of ARDXC in Melbourne and is heard over KSDA - Adventist World Radio Asia on 19720 kHz at 1030 UTC Mondays.

Well, that is all for October. All the best and 73.

QSLs From the WIA Collection (18)

Ken Matchett VK3TL
Hon Curator
WIA QSL Collection
PO Box 1 Seville Vic 3139
Phone (059) 64 3721

Willis Island - VK4KR

This QSL, dated September 1933, is one of very few of the period before World War II from Willis Island. It was sent to Oscar (Ock) Alder VK4JB, and old-timer who obtained his AOCP in 1929, and who was one of the pioneers of radio in VK4. (He is mentioned along with many others in Alan Shawsmith's excellent book "Halcyon Days" - The story of Amateur Radio in VK4, Queensland Australia ")

The Willis Islets consist of three small islands which rise from a bank 21 kms long and 13 kms wide lying some 400 kms from the north-eastern coast of Australia. These were originally called North Cay, Mid Islet and South Islet. The last island is the largest and is today known as Willis Island. It is the only one occupied.

It is surprising to note that no record has apparently been found of any formal annexation of the islands, and in the absence of such it must be assumed that none has taken place. The islands were discovered in the year 1853 by Captain Pearson of the ship "Cashmere", who named them the Willis Islands after the owners of his vessel. The history of the establishment of this weather station is particularly interesting. The reader may find the reading of the book "Willis Island - A Storm Warning Station in the Coral Sea" by John King Davis worthwhile. The book, published by Critchley Parker of Melbourne in 1923, was in effect, the diary of the famous Antarctic explorer (after whom Davis Base was named) when he set up the first meteorological station on the island. It is also interesting to reflect that it was another famous antarctic explorer, Mawson, who set up the wireless station on another island - Macquarie Island, but that is another story. (See "QSLs of the WIA Collection." AR May 1989)

A destructive hurricane had occurred in January 1918, with a considerable loss of life and property. This led to the decision to establish the station as a cyclone-warning base, but the move was delayed due in part to the anxiety for the safety of any personnel left on the island during the cyclone season. However, on the 13th October 1921 at 3 am (records Davis), the steamer "Innisfail" set sail for Willis Island from Townsville, with 15 men and provisions aboard. The wireless equipment included one "complete standard ship's set, 1 1/2 kW, effective range, daylight 300 miles, night 1,000 miles." The first radio signal from the Island was sent on 1st November after the erection of station buildings and wireless masts, the first met message being sent one week later.

Willis Island itself is approximately 520 metres long by 130 metres wide and is only 7 metres above sea level at low tide, and has remained a Commonwealth Bureau of Meteorology station to the present day.

VK9ZC

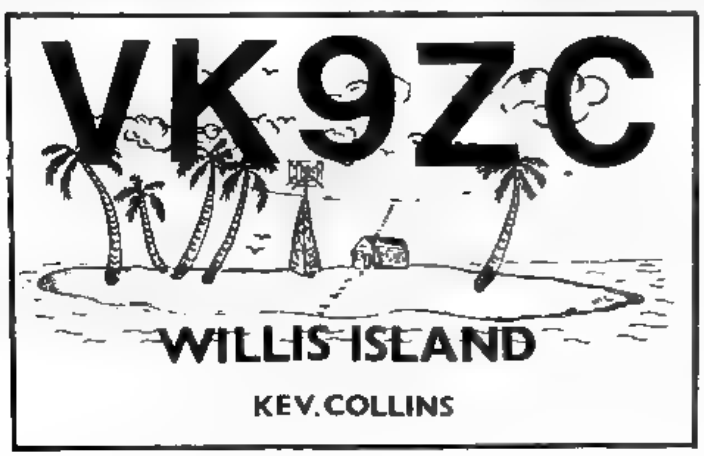
Willis Island first appeared in the DXCC countries list in 1960, by virtue of point 2 of the ARRL DXCC countries criteria. (This deals with islands not having their own governments, but being geographically separated from the mainland by open water). Credits were given on the 1st March 1960 for contacts on or after 15 November 1945. The VK4 prefix was used by the first stations on the island, although the DXCC countries lists of the time showed the Willis Island entry as simply VK. In 1969 the call VK9 together with the identifying suffix Z was used, the prefix allocation being VK9ZA-VK9ZZ (Territories other than Norfolk, Christmas and Cocos Islands.)

There have been several amateur radio operators transmitting from the island. An account of many of these, together with radio station details, are to be found in Ken McLachlan's comprehensive article "Willis Island is a DXers' Paradise" which appeared in "Amateur Radio" in September 1982. It is interesting to note that Australia's first authorised amateur radio phone-patch was made with Willis Island (on 7 September 1981 between Jim Linton VK3PC and VK9ZG).

The VK9ZC QSL is one of the modern QSLs. It was sent by a met officer, Kevin Collins ex-VK4TU. Kevin has written an account of the setting up and operation of the island station, and this appeared in "Amateur Radio" of August 1974. Along with its cubical quad, dipole antenna, an occasional palm tree, and sea birds (there is a large bird population on the island), the QSL artist has made a point about Willis Island being a desolate location. Little wonder that the tour of duty of the met officers is limited to six months, the only contact with the mainland being by HF radio and the occasional emergency air-drop.

If you would like to play a part in building up the WIA QSL collection and to save something for the future, would you please send a half-dozen (more if you can spare them) QSLs which you feel would really help the collection along.

All cards are appreciated, but we especially need commemorative QSLs, special event stations QSLs especially assigned call QSLs (eg VK4RAN), pre-war QSLs, unusual prefixes, rare dx and pictorial QSLs of not so common countries. Could you help? Send to PO Box 1, Seville 3139, or phone (059) 643 721 for card pick-up or consignment arrangements for larger quantities of cards.



Thanks

The WIA would like to thank the following for the kind donation of QSL cards (Supplementary List)

Barry 3XV
Lionel 3NM
Arthur 2AV
Dick 3SV
Robin 6LK
Julian 3KJF (ex-VK4DJ)
Addison SWL WIA 31160
Ossie 3AHK

Also our thanks to the friends and families of the following "silent keys" (Supplementary List):

Jim Marsland VK3NY
Bill McDivitt VK4XM
Alan Herald VK2AHR (ex-VK3AJP)
Ken Kelly VK2MJ
Frank Shiells VK3CAK

DX QSL Contributors' Ladder

(See "Amateur Radio" March 1989, page 55 for details.)

Contributions (Supplementary List):

Robin VK6LK: 3Y2GV ()Peter 1st Island) and 4JIFS (Maly) Vysotskij Is). Two new countries for us.

Prefixes: WD2ØØ, 4X3, 5N5, WY4, W87, CYØ, CU4, BT4.

Special calls: A2BTF, 9M2SEA, KS6SFA.

Barry VK3XV. (26 points)

Prefixes: 4X75, ND3, WJ7, WU5, IO8, NS8, UG7, KM3, WJ8, KZ2, CUØ, CU1, EU3.

Current State of the Ladder

(10 points and above):

Robin	VK6LK	141
Henry	VK3AHQ	91
Chas	VK4UC	56
Eddie	VK8XX	52
Vic	VK5AGX	29
Barry	VK3XV	26
Barry	VK6BS	20
Keith	VK4KS	11
Steve	VK3OT	10

Congratulations

A very fine effort. Can we get a few more top Dxers to part with a few QSLs?

ar

CLUB CORNER

Astronomical Society of Victoria Inc

Amateur Radio Station VK3EKH is now on the air. This is the club station of the Astronomical Society of Victoria Inc, a group of some 600 Amateur Astronomers, whose interests cover all aspects of astronomy. Their interests range from casual star gazing through to serious semi-professional celestial observations and computations to radio astronomy.

The purpose of the Society's radio station is to provide information on current astronomical phenomena to ASV members, and other interested parties via the medium of Amateur Radio. Also to establish National and International contacts with other radio amateurs with an interest in Astronomy.

Information of interest to the amateur radio service will include Sunspot information, meteor showers and aural displays. Radio Amateurs with an interest in astronomy are invited to join the ASV's net and enter into discussions of matters celestial.

The ASV's news broadcast will be mode AM 3540 kHz or nearby depending on QRM, at 1200 UTC Fridays. A callback for radio amateurs will be conducted immediately after the news broadcast, on the same frequency, mode SSB. Information on signal strength, quality etc, will be appreciated. Interested SWLs should contact VK3DDF, PO Box 155, Heathcote, Vic, 3523.

The President
K Harrison
GPO Box 1059J Melbourne
Victoria 3001

Riverland Amateur Radio Club

In May this year, a new club for Radio Amateurs was formed in the Riverland of SA. Called "The Riverland Amateur Radio Club". It is open to all licensed Amateurs and interested persons wishing to take up Amateur Radio as a very interesting and rewarding hobby.

The Club is at present meeting on the 4th Sunday of every month at 2 pm. The membership at present is not large, but the number of licensed amateurs in the Riverland is quite numerous, so it is hoped the Club will gain in strength.

At the inaugural meeting John Rushton VK5ARK was elected President, Kingsley Brauer VK5NOU as Vice President, and Doug Tamblyn VK5PDT as Secretary/Treasurer.

For further information contact Doug Tamblyn VK5PDT, Box 646, Renmark 5341

Doug Tamblyn
VK5PDT RARC.

VK4 Disabled Persons' Radio Club News

The Club extends congratulations to Lindsay Arndt (VK4LMA), a white stick operator, on achieving his Novice Licence and warmly welcomes him into the amateur service/hobby.

He was ably assisted with his studies by Club Members Ray Beutel VK4AKZ - theory and set up, and Mick Johnston VK4JI - CW & regs, and Peter Bread VK4PB - set up, and in getting set up on two metres and HF.

As stated in last month's Club notes, here are the conditions for the "Tony Burge" Memorial Award.

Section 1

An Amateur operator who adequately demonstrates an operational Amateur Station to a disabled person or persons will qualify for the Award.

Notes:

(i) Applications for this section should include Name, Callsign, Address, date of demonstration, and brief outline of demonstration and award fee.
(ii) The Awards Manager shall exercise his discretion as to the merit of the demonstration as a qualification for the Award.
(iii) Demonstrations on, or after, 0001Z on 15 June, 1983 shall be eligible.

Section 2

An Amateur operator or Club who accumulates 10 points.

Points may be obtained as follows:

(a) Contacting the Club Station VK4BTB - 4 points
(b) Contacting a member of the VK4 Disabled Persons Radio Club (either licensed or operating under supervision) - 1 point

Notes:

(i) For (a) and (b) only 1 (one) contact per band per 24 hour period can be counted.
(ii) Applications for this section should include Name, Callsign, Address, log extract countersigned by another person, and the award fee.
(iii) Contacts on or after 0001Z on 15 June, 1983 shall score points.

Section 3

An SWL who hears and records contacts as per Section 2. Details and points applying to Section 2 apply to this Section.

Successful applicants for the Award will automatically be eligible to be granted membership of the "VK4 Disabled Persons' Radio Club" and can allocate points as per the conditions of the Award.

Applications for the Award and the fee of $2.00 should be sent to: The Awards Manager, PO Box 3126, Town Hall, Toowoomba, 4350.

Club Net is on Friday nights at 0900 UTC on 3.590 MHz. Club call is VK4BTB. Station Manager Roley Norgaard VK4AOR (076) 968587, or Graeme Whitehead VK4NYE (076) 306323.

ar

Ballarat Hamvention

The Ballarat Amateur Radio Group will again hold its annual Hamvention on Sunday 29 October 1989

The venue will be at the Sebastopol Football Club Rooms at the Marty Busch Recreation Reserve, 7 kms south of Ballarat on the road to Colac.

This year's event will be similar to previous successful functions, with something for everyone. Also a lucky registration prize of $50

The usual trade display will again attract many exhibitors, along with a number of events in the afternoon, also a home brew competition.

A VHF antenna competition will be run to find out who has the best home brew two metre or 70 cm antenna. Start tuning up your antennas now and bring them along to the Ballarat Hamvention, you may win a prize or find out how bad it really performs.

The usual barbecue lunch will be provided along with afternoon tea, free coffee will be on tap all day

Admission for the day is $8 per person, children under 16 are free. Repeater Channel 3 and 3.600 MHz will be monitored during the day.

The Ballarat Hamvention is a great day out for Hams and their families.

Amateurs or stall holders wishing to obtain more details may contact Kevin Hughes VK3WN on (053) 355011. ar

AUSSAT Moving Ahead With MOBILESAT

Australians on the move should be able to communicate by directly using the next generation of AUSSAT satellites A new service called MOBILESAT will enable trucks, cars, aircraft and ships to carry telephones and other telecommunications devices throughout the Australian mainland and its nearby oceans.

MOBILESAT will come on line in 1992 with the launch of the first of the AUSSAT B series of satellites. Research and development of mobile terminals is underway.

ar

SHOWCASE

Yaesu Spares

Many items can be supplied ex stock. Others can be obtained via frequent orders direct from Japan Also, photocopies from handbooks are available for most models.

Contact Stan Roberts VK3BSR

Bail Electronic Services PO Box 506 Wangaratta 3677 Ph: (057) 662359 (Business hours only).

EMI/RFI Split Ferrites

How often after the equipment is installed do we find we are faced with EMI or RFI interference and to fit toroidal ferrites means hours of painstaking work having to un-wire a connector so that the ferrite will slip over the cable.

A solution is the KG Split Ferrite core that is encased or enclosed with a plastic housing. The core can be easily slipped over the cable and the plastic housing, which has an interlock clip, will hold the ferrite in place

The KG range is designed for both circular and flat ribbon cable. The toroidal styles range from as small as 6.5mm diameter up to 29mm diameter for large cables. The split block cores for ribbon cable is available with 3 slot sizes ranging from 33mm to 65mm. Various impedance values (at 100 MHz) are offered from 90 ohms to 230 ohms.

For a complete catalogue on KG Split Ferrites, contact Clarke & Severn Electronics, PO Box 129, St Leonards, NSW 2065. Tel: (02) 437 4199, Fax: (02) 436 3752.

New Bird Distributor

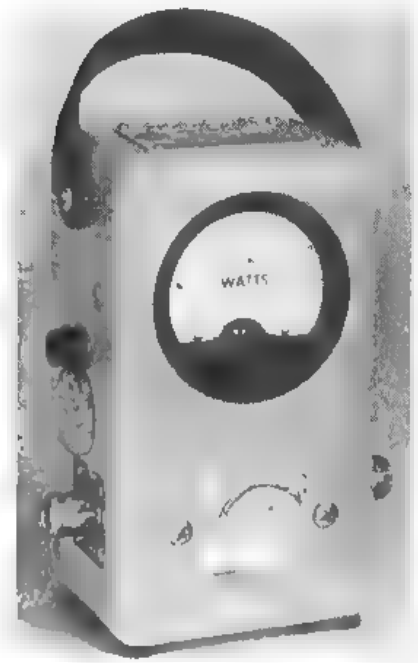
Vicom Australia Pty Limited has been appointed as Australia-wide distributor for the USA based Bird Electronics Corp.

Bird is a pioneer in the engineering and manufacturing of a broad spectrum of RF coaxial test instruments and custom design components. Bird has an ongoing commitment to innovation, quality and reliability which spans over forty years. The company's instruments have become the industry standard language with such names as "The Bird" (model 43 wattmeter), "Thruline" (directional wattmeters) "Termaline" (loads and absorbtion wattmeters), and "Tenuline" (coaxial attenuators) One of the main Bird products is the model 43 wattmeter This has a frequency range of 0.45 - 2300 MHz, and a power range of 100mW - 10 kW using Bird plug-in elements. The model 43 is housed in a rugged diecast aluminium case and the meter is shock mounted.

Vicom General Manager, Mr Fred Grossman, said he was looking forward to adding Bird products to Vicom's other specialist test equipment, "Bird is surprisingly well known world wide and compliments Vicom's top shelf product line."

Vicom's other activities include communications engineering, consulting, R & D, RF and digital test equipment for government, and military and commercial markets. Trade enquiries for Bird equipment can be made to Vicom's branch offices throughout Australia.

Enquiries phone Robyn Kelly (03) 690 9399



Bird model 43 "Thruline" wattmeter.

WIA NEWS

continued from page 31

The guidelines go over such items as transmitter location, antenna installation, antenna coax routing, radio wiring and connection locations, and troubleshooting. The booklet also includes a detailed pictorial showing the recommended placement of single unit transceivers, as well as those with remote heads.

Let us hope that all other car manufacturers rapidly follow GMC's example! ar

HELP PROTECT
OUR FREQUENCIES.

BECOME AN
INTRUDER WATCHER
TODAY

SILENT KEYS

We regret to announce the recent passing of:

Mr Ivan Newport	VK2JF
Mr Frank Alan Barry	VK2ABA
Mr S C G (Jock) Macindoe	VK3ATD
Mr Eric W Trebilcock	L30042
Mr Harry L Roach	VK3DYZ
Mr Jim Sturges	VK4DH
Mr H M Dow	VK4KHD
Mr C W Austin	VK5CA
Mr Stanley Atkinson	VK5VW

Francis Allen Barry VK2ABA (1922-1989)

Allen died in St Vincents Hospital Darlinghurst on 30 July 1989 after a short illness

His familiar call sign VK2ABA and strong signal will be remembered by many. He was a member of the WIA for many years, also the RNARS and the Old Timers' Club.

His life long interest in radio was stimulated during his service in the Royal Australian Navy, which he joined in 1939 - he served until 1956. He was involved in most Naval theatres of war between 1939-1945, and was on the HMAS Shropshire at the signing of the Peace Treaty with Japan in 1945. He also saw service in the Korean Campaign.

He worked in the Naval Dockyard Police, and also as a radio/radar instructor at HMAS Nerimba until his retirement in 1979.

He was a close friend of many and will be sadly missed by John VK2XW, and Allen's relations Mary, Noel, and Beb, and family.

A J Voysey VK2XW

Harry Roach VK3DTZ (1907-1989)

The end of July heralded the passing of another "Old Timer", Harry Roach VK3DYZ.

Harry first entered the field of Amateur Radio in the early twenties when he built his first crystal set and the progressed to the triodes and pentodes of the day. He was well known for his meticulous workmanship, and his skills in the construction of communication receivers often produced results which surpassed the commercially made units then available.

During World War 2 Harry served as a radar operator in the RAAF and was stationed in the islands to the north of Australia. Following his discharge Harry became very active as an SWL and for many years was Secretary of the Short Wave DX club. He regularly ran a segment on the Sunday broadcast on VK3BWI. Harry was one of the earliest members of the Moorabbin Radio Club, and in recent years one bright spot of his week was the regular "get togethers" with the "Old Timers" on Tuesday mornings. Another highlight in Harry's life was his regular visits on a Thursday to another great "Old Timer", Col Chirnside VK3WQ, and after much cajoling and encouragement, he was persuaded to sit for his Amateur licence. Harry passed through his Novice and Limited calls, and then the AOCP, and was allocated the call VK3DYZ.

During the post-war years, Harry developed another interest - the organ, and his Baldwin was played to perfection. Harry was the organist at a number of local churches.

Always ready to assist both the youngest and oldest members of the radio fraternity who were always welcome in his shack, Harry's passing followed a long period of patient suffering, and many visits to hospital since 1953.

Condolences are extended to his wife Rene and son Geoff - he will be truly missed by all who knew him.

VK3WQ and VK3XV.

Jim Sturges VK4DH

North Queensland amateurs were saddened by the recent passing of Jim Sturges VK4DH of Townsville. Jim will be remember for his dry wit, and his behind-the-scenes assistance for anyone who needed help.

Jim was educated at Charters Towers, and commenced his employment in Queensland Railways as an apprentice coppersmith. He then changed to a clerical appointment as a train controller, just in time to volunteer for the RAAF in World War II. His training in Canada started as a fighter pilot, but once again, he changed direction and finished up as a navigator on Halifax bombers.

His wartime experiences were with No 77 Squadron in raids over occupied Europe. He was engaged in bombing raids over Cologne, Eindhoven and Stuttgart, among others. During one raid, his plane was hit by a falling incendiary bomb from one of the "friendly" bombers, and the whole crew had to bail out over occupied territory. As a result of his exploits, he was awarded a Distingushed Flying Medal.

Jim was a foundation member of the Townsville Amateur Radio Club some 30 years ago, and had been a member for most of the intervening years. He served as Secretary, and was for many years a Trustee of the Club.

Jim's hobbies were many and varied, and included home-brewing projects for amateur radio, as well as making educational kits for his grandchildren. He was into computers and packet radio in recent years. Much of Jim's older amateur gear is now on display in the RAAF Museum at Garbutt.

We extend our sympathy to Jim's family, including his brother Frank VK4ATV, who supplied much of the information about Jim's ca-

Peter Renton
Townsville Amateur Radio Club

Brian Wilson Austin VK5CA

Brian joined the Silent Keys on 22 July 1989, at the age of 73.

After serving in the RAAF during World War 2, Brian joined the WIA as a student member in 1945. He was licenced as VK5CA in April 1948.

Coopted onto the VK5 Divisional Council in 1949, he remained on Council until 1962, having held every position except those of Treasurer and Federal Councillor. He continued as Editor of the VK5 Journal, a position to which he had been appointed in 1960 until 1968.

He was made an Honorary Life Member of the WIA in 1968 in recognition of his service to the Institute. In 1973 he undertook the job of Federal Awards Manager and continued in this position until 1978.

Due to ill health, Brian retired from the Commonwealth Public Service in 1970. Despite this handicap, Brian enjoyed operating, particularly DX, and was active in WICEN in SA, for which his location, high in the Adelaide Hills, was ideal. In the latter years his wife, Marlene, gained her licence as VK5OO, and took over most of the WICEN activities.

Their home at Crafers was always open to their many friends, and was the background for an ABC TV presentation on WICEN.

Brian will be missed by the many amateurs and others who knew him. I am proud to say he was my friend.

Our sympathy is extended to Marlene VK5OO, and to her sister Valda VK3DVT.

Geoff Taylor VK5TY

Eric W Trebilcock

Doyen of Amateur SWL - both at international and Australian level, Eric W Trebilcock, BEM, passed away at Myponga, South Australia on 7 September 1989, aged 78 years.

Somewhat incongruously, Eric held a PMG First Class Operators' Certificate of Proficiency for almost 50 years, yet during that period he did not take out an Amateur Operators' Licence (He did, however, hold an Amateur Call VK5TK for a brief period pre-WW2.) Brim full of enduring enthusiasm for Amateur Radio in general, Eric ran the WIA Inward QSL Bureau for very many years. In recognition of that stupendous dedication he was made Life Member of the WIA.

The designators BERS195 and L30042, assigned to Eric for so many years are familiar to all enthusiasts in the SWL field. Present and past DX Column Editors of most Amateur magazines throughout the world have reason to remember EWT for his carefully prepared and detailed reports of stations heard in SE Australia on all HF bands.

Eric frequently won first place in the SWL Section of the annual BERU Contests and was proud to display a number of rose bowls awarded to mark his performances. His SWL Reports were also an inspiration for those SWLs seeking to obtain QSL cards from DX stations. They were precise, detailed and authentic with the result that his collection of rare QSLs is outstanding by any standards.

Apart from a relatively short period of service as a Postal Assistant with the PMG, "Treb" devoted all his professional life to the Department of Civil Aviation, Flight Service Branch. As an Aeradio operator stationed at Salamaua, New Guinea in late 1941, he saw "active service" like many civilians in that area. The story of his trek on foot over the mountains to Port

Moresby to escape the oncoming Japanese is almost legendary. Later, in various technical administration positions, he became well known for his skills and knowledge in the frequency management field.

The WIA extends its sympathy to Eric's wife Aline, his son Robert, daughter-in-law Penny and their children. He will be sadly missed by his family, friends and the Amateur fraternity throughout the world.

Allan Foxcroft VK3AE
and Ivor Stafford VK3XB

Scouts Bouncing Around the Satellites

This year's JOTA (Jamboree-on-the-air) promises to be bigger and better than the past few years.

Once again, with the help of AUSSAT, satellite technology is a major player in this annual event on the 21st and 22nd October.

For the past two years, Scouts and Guides participating in JOTA have utilised half-duplex links via AUSSAT's satellites. This year, it's even better: there are two extra services being provided.

A significant addition is a full-duplex link (simultaneous talk and listen capability) provided on 2m TX and 70cm RX in Sydney and Perth.

For the first time, this year Perth and Sydney will be able to communicate with the New Zealand National Repeater Link System via satellite. This service will be half-duplex only.

Also, a half-duplex capability is being provided between Sydney, Melbourne, Perth and Brisbane, on 2m RX/TX links.

All of this wouldn't be possible without the help of AUSSAT and the generous loan of equipment by Robin Chapple, National Sales and Marketing Manager for ICOM (Australia) Pty Ltd.

This equipment for the full duplex link is:

- Two IC3210 Base/Mobile full duplex transceivers.
- Two 2m/70cm dual band antennae for the IC3210.
- Two IC32 AT full duplex hand-held transceivers for test and evaluation purposes.

All frequencies and times of all links are to be announced on each Sunday up to three weeks before JOTA, on WIA news broadcasts.

Neil Faifshaw
VK[illegible]

OVER TO YOU

Wrong Use of Three Pin Plugs

Three pin plus should NEVER be used on 12V equipment. The method suggested in the article on page 31 of the September edition in many ways added to the dangers.

(1) It contravenes the SAA wiring code relating to the use of extra low voltage fittings.

(2) The suggested idea of wiring the active and the neutral pin together has a number of hazards and is unlikely to protect the equipment.
Fuses do not blow instantaneously, not even correctly rated ones. In the time the fuse takes to blow, a considerable voltage drop will occur in the neutral line and the pin connection. This voltage could easily exceed 12 volts.
There is considerable risk of suffering a burn if such a shorted plug is inserted in a live socket. This was mentioned in the Victorian Division's weekly broadcast.

(3) Any system imagined to be safe will be relying on the 3 pin outlet being wired in what is NOW considered the conventional manner. However, as many older readers will remember, prior to switch/socket combination units, the active and neutral were freely swapped between the pins. Also, in what were considered to be "non-hazardous" situations, an earth connection was not required. In older domestic installations, such wiring still exists. There is no "safe" way to wire a plug in such a situation.

(4) The idea is UNNECESSARY. Polarised, 2 pin plus are readily available from electrical wholesalers and many electronic retailers. I refer to the fittings which are frequently called "T" plugs due to the fact that when mounted in what has become that standard manner, the pins form a "T". When mounted this way, the top pin forms a minus sign and is, therefore, generally used as the negative pin.

These fittings, wired in this manner, are accepted as a standard by many emergency authorities.

Finally, under NO CIRCUMSTANCES should you use ANY conventional 240V fittings for low voltage equipment. You put your own life at risk, and the lives of others, who are unfamiliar with your equipment, are at even greater risk.

Geoff Syme VK3ACZ
PO Box 91
Irymple 3498

(We apologise for publishing the original article without adequate technical evaluation. Even the best editorial systems can occasionally be short-circuited! But the fuse has now certainly blown.! Ed.)

More on Polarised Plugs

I was staggered to see the article by VK2BIN regarding the use of 240 VAC 3 pin plugs and sockets for 12 VDC. I do congratulate him on making the wiring as fool proof as possible, but not all people - amateurs or not - are as aware or careful in what they plug into 240 VAC GPOs (General Power Outlets). Some quite small equipment does have inbuilt 240 volt power supplies and others do not - an unthinking person may plug the equipment into the 240 volts, even if the plug is marked 12 VDC./

However, the above reservations aside, there is a very real danger of electrocution if there is non-standard wiring involved in the home. It is not unknown for the on-off switch to be in the neutral line which means with the power turned off there would be 240 volts AC on the outlet, and the shorting link would be ineffective until the power switch was turned on. 240 volt power on the 12 volt equipment would swiftly ruin it. Whoever was touching the metal case at the same time, if the earth was not connected to the earth pin of the 3 pin socket would be lucky to [illegible].

Some older homes do not have the earth pin earthed, except in "earthy" situations, also a number of power points in older installations did not have any convention for the wiring of active and neutral and may have the neutral and not the active switched. This could occur where home handymen or with little electrical understanding could easily cut "unnecessary" earth wires or wire up power points with the good old Aussie attitude of "she'll be right mate."

I cannot stress too strongly my belief that this would be a most unwise and dangerous practice and although safe in VK2BIN's hands, could be most unsafe in a lot of other peoples' hands. Consider also, even smarter know-it-all, who finds that the device blows fuses when plugged in, opens plug up, finds some dill has put a short across the active and neutral, isn't sure which lead the main wire came from and wires it to the active line! Perhaps no blown fuse but certainly a blown set when power turned on.

It might be thought that I am overstating the situation, but Ian, believe me, there are people like that out there and installations like it.

To overcome the possibility of confusion why not use the 2 pin polarised plugs and sockets that are manufactured by Clipsal and HPM. The pin configuration is like a "T". These plugs and sockets have been mentioned many times in "AR" over the years. There is no chance of being able to put these 2 pin plugs into a conventional 3 pin socket, hence even a bird brain can't get it wrong.

Rodney Champness VK3UG
2/95 Benalla Street
Benalla 3672

Those Plugs Again!

I refer to an article appearing on page 31 of the current (September) issue of AR, contributed by VK2BIN, where it is suggested that ordinary 240 V 3 (flat) pin plugs be used as polarised 12 V DC plugs.

It is stated in that article that as a safety measure(!) a connection should be made between active and neutral so that if the plug was inadvertently inserted in a 240 V socket it would blow the fuse!!

As a licensed electrical contractor, and one who is deeply involved in the manufacture and distribution of plugs and sockets in Australia, I find it incredible that such dangerous and illegal practice should be published by this magazine.

Apart from the fact that such practice is strictly illegal (refer to any supply authority), it can also be quite dangerous to the operator when a direct short is inserted into a domestic 3 pin socket

Tom Peyser VK2ETP
11 Kara Court
Randwick 2031

(There is nothing illegal about the use of such plugs for 12 V Tom, but it is ill-advised, as you rightly point out. Ed.)

Still More on Polarised Plugs

In AR Sept 1989, Ian VK2BIN has reported his use of 240 volt 3-flat-pin plugs on 12 volt DC circuits. He has suggested reducing the risk that they might be plugged into a 240 volt socket by ensuring that it would blow the 240V circuit fuse

It would be simpler and much safer to use 2-pin"T" polarised, 15 amp, 32 volt plugs and bases, which are made by at least the two major manufacturers of electrical wiring accessories and available from the many sellers of such materials. The pins on these plugs are of similar size to those on the 3-pin plugs but arranged in a T formation

I have used them successfully for DC circuits in my shack and also for quickly connecting a TV ladder type transmission line to a balanced ATU or to ground

Frank Aston VK1FA
63 Ambilindum Street
Hawker ACT 2614

Pedal Power!

I suggest that the WIA QSL Bureau organisation will be interested in the following

Having worked G4BRE (Maurice) in Crawley, Sussex, my QSL card was transported to Crawley, and delivered personally to Maurice by a pedal cyclist who passed through Adelaide on his "round-the-world trip" by bicycle.

The QSO took place on 8 February 1989 and the card was handed to Maurice on 5 August 1989. The cyclist was one, James Dawton, aged 27, a university graduate whose home is in Oxford, England. He spent three days at my QTH in the Adelaide Hills

During the QSO I asked Maurice if he could advise James' father in Oxford of his son's present position on his tour, at the same time passing the parents' telephone number in Oxford. James was, of course, with me in the shack. Maurice replied, "Wait one, I'll do it now." The following communication line was set up immediately

(1) James Verbal voice to me - VK5YD
(2) VK5YD to G4BRE - CW 14 MHz
(3) G4BRE (Maurice) to Dawton Snr - GPO line to Oxford

. . and, of course, the line worked both ways. Dawton Snr was both amazed and delighted; James was equally please, and Maurice expressed the view that this sort of thing makes Amateur Radio worthwhile. He also advised me later, by letter, that he had called in two other nearby "G"s and that they had "wined and dined" James as well as offering him a bed for the night.

I think this was a pleasing exercise!

VHA McBratney VK5YD
PO Box 151
Blackwood 5051

SM7PKK Pacific Tour 2 - 1989/90

Here is some additional info about my trip. As I said before, I planned to travel partly with other EU operators. Now it is time to release more info. OH1RY, some other Finnish operators and I have planned to visit Tokelau ZK3. These plans are now final. We will leave Apia on 2 November and operate from 4 to 14 November. We plan to have two stations on 24 hours a day working pileups and then another station working WARC and RTTY. Before the Dx-pedition we will be spread out over some of Pacific countries, all fighting to get the highest score! I will be at American Samoa working as KS6/SM7PKK

My personal QSL-managers WILL NOT HANDLE QSLs FOR TOKELAU DX-Pedition. The Finnish people will take care of that. This is VERY important.

After the Tokelau DX-pedition I will stay in Western Samoa to work the CQ WW CW Contests while the Finns are travelling home. I will sign 5W1HK and QTH will be Apia as last time.

After that, I will go back to Fiji and probably on to Tarawa T3Ø, but not for sure! You will find me on the bands from some islands though. My plans will change during the trip depending on my money reserve and what islands are activated by others.

QSLs for MY OWN DX-pedition should go to my home address.

SM7PKK
Mats Persson
Betesv 22
S-240 10 Dalby
Sweden

You can send QSLs while I am travelling as I have different managers, with SM7EQL Ben in charge, organising it the best possible way. Please SASE and ONT" MIX QSL for different operations. In return, we will send QSLs for all contacts you have had with me on that single operation! Meaning you don't have to send QSL for every QSO! Fair enough!

Anyone interested in supporting my trip are welcome to do so. I will travel and activate as many countries as possible. At the latest, I must leave Pacific the 21 May 1990. That is the date when I must travel home, according to my ticket. That limit and the money limit are the only ones!

My Sponsors are:
Naval Electronics AB
Swedish Radio Supply
EUDX-Foundation

73 de Mats
SM7PKK

Cross-Band Repeaters

Dear Sir,

I have just read in AR (August '89) that the Melbourne repeater VK3RHF is soon to be operated as a "closed" repeater. Personally, I think the WIA will be stabbing limited licensees in the back if they throw support behind the idea of "closed" repeaters.

Limited licensees have been discriminated against for years by being prevented from operating on the HF bands because we have no Morse code qualifications. Now we must put up with yet more discrimination by being prevented from operating on a frequency in a band which, until now, we have had free use of as limited licensees.

Band-planning and "gentleman's agreements" aside (and that's really all band-planning is, a "gentleman's agreement"), what is to stop me from operating on this or any other "closed" frequency in the VHF-UHF amateur bands?

If the WIA supports this type of venture, it should hang its head in shame. If not, then it should petition the DOTC to withdraw its permission to allow this service to operate OR negotiate with the DOTC for permission for limited licensees to use the service also. Note, I do not wish access to all the HF bands, but if a repeater operates on VHF or UHF frequencies (where limited licence holders are permitted to operate) and it also retransmits on an HF band, then it should be open to all operators, full, limited and perhaps novices too (they are allowed to operate on VHF FM too.) Any other arrangement hints at discrimination.

The WIA pushed hard enough for permission to allow novices on 2m FM; how about pushing as hard for limited licensees to operate on the so-called "closed" repeaters down on 10m?

Angus Garland VK4QV may have hit on a good idea in his letter published in "Comments" in the same issue, and no doubt there will be a few others who feel inclined the same way about another society or organisation to represent radio amateurs. The WIA should make no mistake. Sure, the IARU will only recognise one society from each country, but in Australia's case it does not have to be the WIA. Perhaps the society with the largest membership should represent us at the international and national levels.

No doubt, the comments above will stir a few to putting pen to paper (the more the merrier), and probably most will criticise what I have written (again, good; it's a free country). But, perhaps there will be a few letters of support for the "opening" of "closed" repeaters on 70cm and 10m.

One last point, if anyone thinks I'm WIA-bashing, they're quite right. I paid my renewal subscription last week and I think I'm entitled to my criticisms in these pages, as are you (if you're a member).

George Christie VK3XEC
19 Browns Road
Montrose 3765

(The WIA is not unsympathetic to your viewpoint, George, in the occasional case of input on VHF/UHF, output on 10m. But DOTC is obliged to support the international regulations - no HF without Morse qualification - whether relayed or

direct. The WIA has not "stabbed you in the back", we are still "pushing". Ed.)

Six Metre Usage

I would like to bring the following information to the attention of all Six Metre Band operators as a matter of urgency

Recently, after over 25 years of concerted effort by numerous Amateurs, we have regained restricted use of the lower end (50 050-50.200 MHz) of the 6 Metre band.

The use of this segment is quite different in character from the more familiar 52 000-54.000 MHz sub-band. The first 500 kHz above 50 000 Mhz is essentially "International" in character. From observation of operating procedures by many stations over recent weeks, it is painfully clear that many people haven't a clue as to the operating conventions used. The following applies:

(1) The section 50.000-50 010 MHz is reserved for EME (ie: Moonbounce) experimentation ONLY

(2) The section 50.010-50.100 MHz is for CW use ONLY

(3) The frequency 50.110 MHz is an INTERNATIONAL DX CALLING AND LISTENING FREQUENCY.

That is not simply MY interpretation but INTERNATIONALLY ACCEPTED OPERATING PROCEDURE, observed by operators in all major countries using the 6 M band, including Japan and the USA. This is no different from the international use of sub-bands on other major Amateur frequencies such as 14 MHz etc.

Local stations have been observed, REPEATEDLY, tuning, testing and rag chewing across town on 50.110 MHz. During one recent session, an experienced operator was copying weak CW on 50.110 MHz and very politely asked the local stations to please QSY from the calling frequency. With much bad grace, the locals very reluctantly shifted to 10 kHz higher and continued to rag chew and splatter over 50 110 MHz while the JA on CW was completely obliterated.

The same stations causing these problems constantly grumble about being asked to QSY off 50 110 MHz, and claim: "If we are not there, no-one will know the band is open." During the above incident, none of the rag chewers heard the DX station because they were all so strong that they drowned it out. When running 100 watts and working stations a few miles away, how can you hear weak DX under S9 + 40 dB signals?

One could be charitable and say that these operators are simply inexperienced, however, we are rapidly approaching the sunspot maximum and we will shortly experience the best 6 M DX conditions ever. Unless we are very careful, stupid operating by people who refuse to accept conventional operating procedures will prevent hundreds of other operators from hearing or working extremely rare DX stations, which we will probably never hear again.

PLEASE keep 50 100 MHz clear unless you are establishing communication with a DX station. When you do establish contact, QSY off the calling frequency and go UP the band WELL CLEAR of 50.110 MHz. If you want to talk across town there is up to 4 MHz of 6 M other than the calling frequency on which to do it. There is NO necessity for local QSOs below 50 150 MHz and as the band opens up the QRM in the section 50 100-50 150 MHz will be bad enough without having local QSOs and their resultant splatter across the band. At least have some consideration for the many serious DXers trying to use the band intelligently.

If you do hear a station misusing 50 110 MHz, please explain to them that it is in their interest as much as in everyone else's interest that the calling frequency is properly used and NOT abused.

Geoff Wilson VK3AMK
7 Norman Avenue
Frankston 3199

JOTA or JOKE ?

Ladies and Gentlemen,

For the last three years, several of us (technicians at a commercial television station), have made freely available our time and equipment for the sole purpose of helping the Scouting fraternity participate in Jamboree of the Air. However, it is becoming glaringly apparent to us that most of the Scouts who have used our facilities are not the slightest bit interested in talking to their counterparts across the globe, but more in playing the fool and generally misbehaving.

Last year, a $2,000 rig almost landed on a concrete floor when two young Scouts decided to play a game of tag around the operating desk. Had it crashed, who would be held responsible for the damage? The Scouts? The station? Their parents? We all know the answer to that one I'm afraid! The poor old amateur can only smile and say, to quote a well known personality on our television network "Well, that's life folks."

As a result of these problems, our organisation has decided not to participate in any more JOTA exercises. Whilst this letter is not intended to be a slur on all Scouts and Girl Guides, it is intended to convey to all concerned that the proverbial ship by need a good shake up!

73 David G Barneveld VK4 BGB
PO Box 275
Booval 4304

(In the interest of the continuing success of JOTA, we hope that David's experience is very much an isolated case. Ed.)

Mobile Law

The legal position regarding mobile operation in a moving car, ie: while driving, is quite clear. It is illegal to use a hand held microphone while driving, because only one hand would be available to control the car.

I do believe that the use of hand held microphones and the switching on and off of a transmitter while driving is dangerous and irresponsible and I agree with possible police action against drivers - be they amateurs or CB operators - who put themselves and others at risk.

However, there seems to be a solution. It is quite easily possible to use a throat microphone or one fitted to a head band, and to switch the transceiver with a voice operated relay (either external or vox, if built in). However, built-in vox would probably be unusable due to the high degree of background noise. If the head band contains earphones, only one should be used, to keep one ear clear for the sound of emergency sirens.

I do not think that this mode of operation is covered in any regulations. It is, therefore, suggested that the WIA take this matter up with the authorities concerned with a view to obtain official approval (perhaps restricted to licensed amateurs) for it use.

Yours sincerely,

George H Cranby
VK3GI
PO Box 22
Woodend 3443

(The use of hand-held microphones while driving has been illegal only in Victoria, and more recently, in NSW, but apparently only as regards mobile telephones. Traffic regulations are a State responsibility, so action to alter their interpretation must come from the relevant Division. Ed.)

Now Hear This

Ladies & Gentlemen,

For some time now I have been reading various members' comments regarding the new membership fee rises that are being introduced to the WIA.

The general attitude that the bulk of the writers convey is that they do not intend renewing their membership when it next falls due to be paid. Nevertheless, I have not yet seen a letter from any member genuinely showing that the new fee rise will cause him or her real hardship.

On the contrary, the general view being conveyed appears to this writer to be that unless the WIA maintains the old fees, they (the writers) will resign from the Association. This sounds to me to be a small case of blackmail!

Let's face it folks, times move ahead whether you like it or not! My suggestion is that if you genuinely cannot afford the new membership fees, yet still wish to remain a member, then write to the Executive Office and tell them so. I am sure something could be worked out for you in the long run.

If, however, your sole aim is to whinge continually and thereby try and influence other WIA members into resigning via the pages of AR magazine, I strongly suggest to you that you put all your whinges down on paper, but don't send it to AR.

Instead, vent your anger by attaching the letter to the front of your rig, pouring petrol over it, and then chucking in a match. With a bit of luck, not only will the majority of members be relieved of the whingers who constantly appear in AR magazine, but we will be relieved of them on air as well.

73 David G Barneveld
VK4BGB
PO Box 275
Booval 4304

Room for a Waffle?

Over a period of several years, I have enjoyed a regular Sunday morning "sked" with a VK3.

On Sunday 30 July 1989, a "Breaker" made the comment that we were "waffling". A polite request by my VK3 friend for identification eventually brought forth a response by a VK2.

If "waffling" is an offence I plead guilty to the charge, as must thousands of amateur operators world wide.

Being a "gentleman" is one attribute of a commercial or amateur operator. I was encouraged to become involved in the fascinating activity of Amateur Radio by such a "gentleman" twelve years ago when my lifestyle was changed due to becoming physically handicapped. I have met "on air" many persons likewise handicapped by the effects of multiple sclerosis, injury, blindness, to name but a few of the disabilities which prevent us from leading a normal lifestyle

On reflection, I am sure that the VK2 concerned would in no way deny us the privilege of the occasional "waffle" in maintaining communication with the outside world. This, in particular, applies to the many OM's and YL's who are confined due to their disability problem.

May I express my gratitude to the many "gentlemen" and "gentlewomen" who continue to enrich my life through the medium of Amateur Radio.

73 All around
Kev Mashford VK4LM
16 Forum Close
Mooroolbool Cairns
4870

Subscription Increases

The proposal to increase the federal share of subs revenue by 48% is not receiving much attention in the Over to You column of AR There could be one or more of the following reasons for this.

- The editor is not publishing all comment received *(We publish all. Ed.)*
- Protesters fear repercussions on the grounds of "uninformed comment" *(Fools rush in. . . ? Ed.)*
- Members are resorting to the old remedy for bad leaders - ignoring them. *(Shooting the messenger doesn't alter the bad news. Ed.)*
- The persuasion campaign to make the proposal (right or wrong) acceptable is succeeding *(The proposal is unavoidable - we hope persuasion succeeds. Ed.)*
- Many members are protesting elsewhere
- Many members have decided not to renew in December.

If I were President, I would be worried about those possibilities and looking for more assurance than a belief that members will accept the proposal

The proposal should be capable of support in terms of logical reasoning applied to the facts, but in support, we are offered the Presidential assertions, that "the divisional representatives saw the need for the WIA to operate on a professional footing", and "we need to project a professional image", and "the WIA is seriously under-funded."

The supporting facts have developed and gradually surfaced subsequent to those assertions. The institute has adopted the presently fashionable (in Australia) corporate management system. Because it is not possible to have a management collective without a collection of managers and we were short of those, we now have paid managers:-

- a General Manager
- an Assistant General Manager
- An Advertising and Administrative Manager
- A Members and Circulation Manager
- An Accounts and EDP Manager
- A Managing Editor

To boost the collective periodically, the divisions supply "management oriented" councillors. *(All of these "managers", bar one, have existed for years, they have simply been re-titled. Before the Managing Editor we had Production Contractors. Ed.)*

If there are not enough managers available, you make some. My shire have recently created a corporate management structure. To make up numbers they elevated(?) existing staff right down to the dog catcher - he is now the Pest Control Manager!

Our management collective now meets more frequently, for mutual reinforcement, to practice rhetoric and oratory, and for extended lunches and dinners Those last are essential - without the benefit of after dinner ruminations in company with "bright young marketing gentlemen from a service industry" we would now be without the benefit of the present developments.

To support and assist the management collective we have management services (not to be confused with member services), comprising new and expensive office machines (more to come) and bright people to operate word processors, feed data banks, do magazine illustrations, seal envelopes and lick stamps. *(I assume the preceding two paragraphs refer to your shire, Lindsay. They are NOT true of the WIA. Ed.)*

The outcome of all that is the need to make do with what we have and make up for inefficient resource utilisation by injecting more. But is an increase in members subs the best method? Probably it is not. The consequent drop in our share of the ARS market, coupled with the need for concessional rates for some members will result in a subs revenue increase of much less than 48%. Most members will be disadvantaged financially The 48% increase will most likely produce less than 30% increase in usable funds That is not value for money

I suspect that our leaders are planning further commitments at members' expense There is a high probability that we will recruit paid professionals to provide "amateur member involvement in the Australian Preparatory Group leading to the National position papers " (for WARC) "That amateur representation must be regular, continuing, and technically competent." Is that a job description favouring a present member of executive? That, plus inclusion of "competent amateurs in national delegations to ITU conferences and meetings."

Is the present executive being too ambitious? Is someone creating a personal memorial, or maybe a WIA tombstone?

Lindsay Lawless VK3ANJ
Box 112
Lakes Entrance 3909

(Your suspicions are unfounded, Lindsay We cannot afford "paid professionals" for WARC. Our intended delegates are technically competent. Far from being ambitious, we are compelled to react credibly to reality If the end result is a "WIA tombstone" at least we will have tried. Ed.) ar

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It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974 Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly.**

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HAMADS

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VZ300 COMPUTER with RTTY modem amber screen monitor data cassette, CW interface, and Morse program, 232 serial interface with power supplies and leads $450. DX400 coms RX $250. IC751 with filters CW/wide SSB desk and scan hand mic $1750 - VK4UO QTHR.

FOR SALE - SA

MICROWAVE Modules Ltd 430 MHz transverter MMT 432/28S (10 mx to 432) satellite model 10W output $250. Also dual gate mosfet 2mx converter MMC28/144 $100. 6mx linear metal work only with new 3-500Z Eimac tube socket and chimney as per ARRL handbook $350. Mobile mount for TS120S $50 - Jeff VK5OH (086) 257084.

TELCON semi air spaced twin coax 2KW to 2MX, transmitting tubes 4-65A; 4E27(813) Gundig reel-to-reel recorder two sets tubes KW2000; Portable Diathermy 600 watts 7 metres; Post-war receiving tubes new ribbon micro - VK5LC QTHR (08) 2716841.

FT DX400 Yaesu HF/Transceiver good working cond serial no 80998 new finals handbook $280 - Doug VK5AJR (087) 372983.

SWAP - VIC

ATN 6 element log periodic beam 13-30 MHz. Exchange for ATN 6 element log periodic or similar - Bruce Kendall VK3WL (03) 7417654 AH, (03) 544 4888 BH, (03) 543 4553 Fax.

WANTED - NSW

VALVES 1Q5GT, filter choke 60 mA 10H Rola or similar, plastic coil formers RCS any dia or pins - Stan VK2KSD QTHR.

HAMADS

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.

*Eight lines free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclosed a mailing label from this magazine with your Hamad.

*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.

*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.

*QTHR means address is correct as set out in the WIA current Call Book.

*A courtesy note will be forwarded to acknowledge that the ad has been received.

Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.

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❑ Miscellaneous
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YAESU FV901DM scanning remote VFO must be in top cond - VK2UH QTHR (048) 402228.

APPROX 70 feet tower crank-up galv guyed base plate no guys required price delivered to Bowral, must be A1 - A Walsh L20181 QTHR (048) 612092.

UNIDEN 2020 matching speaker and ext VFO - VK2AJE (02) 525559.

VALVE tester with manual and/or manual for Palec VCT-2 vale tester - Andrew Kay (02) 5551408.

WANTED - QLD

YAESU FT726 VHF/UHF Icom 271 or Kenwood VHF base transceiver, write to John Newman 26 Leichhardt Place, Glenden 4743.

ELECTROPHONE base command module power supply in working order or not - Peter VK4MKT QTHR (079) 857848.

TA 14-17 ex RAAF Base TX, please write to David, 70 Brisbane Avenue, Camp Hill, Qld 4152 (07) 3982840.

WANTED - SA

TL120 Kenwood HF/Linear in good working order - Doug VK5AJR (087) 372983.

DIGITAL frequency meter, prefer units with a 7216A basic counter chip or 1 GH2 frequency limit, does not need to be working - VK5MC (087) 359014.

SIX meter conversion details for Bushranger CB or similar unit, any help appreciated - Alan VK5BWG, PO Box 1337, Stirling North 5710, SA.

WANTED - WA

FT200 ext fittings VFO Linear trans vert fixed xtals anything made for them, also DC/DC supply 12V original parts pref - VK6NST (09) 4192951 rev chg accepted.

WANTED - TAS

FT77S, TS130V or similar rig in good working order with manual - Keith VK7SU QTHR (003) 944189.

YAESU FC-103 antenna tuner, must be in mint cond with books etc to complete 301 station - David (004) 252030.

FRAME or loop antenna commercially made suit antique battery operated TRF radio top price paid - (004) 261520.

WANTED - VIC

NALLY wind up tilt over tower or Hills wind up suitable for tilt over conversion - Leo VK3BSC (03) 5983115.

CIRCUIT or handbook for Pye TRP-1 HF portable valve transceiver, photostat would do, will pay costs - Rodney VK3UG QTHR (057) 621454.

RADIO service manuals Vol 6 (1943) and Vol 9 (1946) also RCA receiving tube manual - Ralph VK3CQK QTHR (058) 521372.

CIRCUIT diagram for AWA Skyranger HF transceiver type HC-5-R. Geloso VFO unit 4/104 six bands - Manuel QTHR (03) 6107175 BH, (03) 6107711 Fax (att: Manuel).

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ICOM BELIEVES FLEXIBILITY SHOULDN'T STOP HERE.

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So when the time comes for you to change frequencies, expand your system or reprogramme your handheld for different jobs, your aystem leaves you tied up.

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We recognise that different users may require different applications, so we've built a range of UHF and VHF handhelds to suit your requirements.

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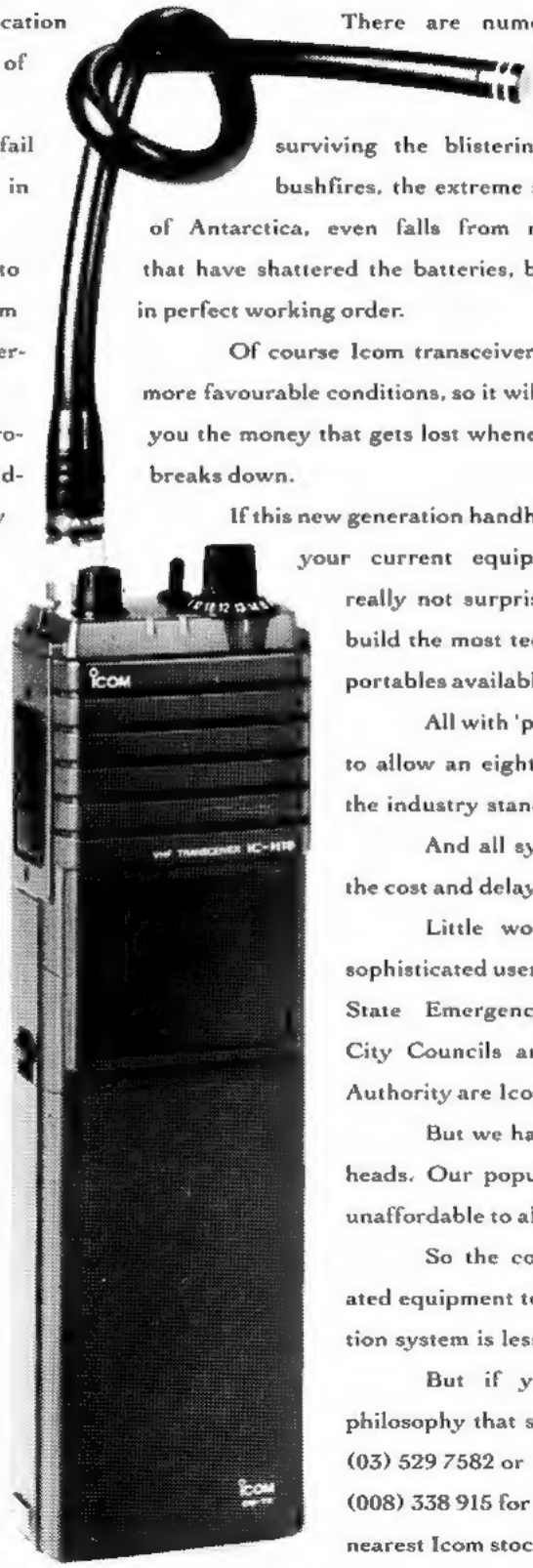

There are numerous stories to tell of the Icom handheld's durability. Such as surviving the blistering heat of Australian bushfires, the extreme sub-zero temperatures of Antarctica, even falls from multi-storey buildings that have shattered the batteries, but left the transceiver in perfect working order.

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